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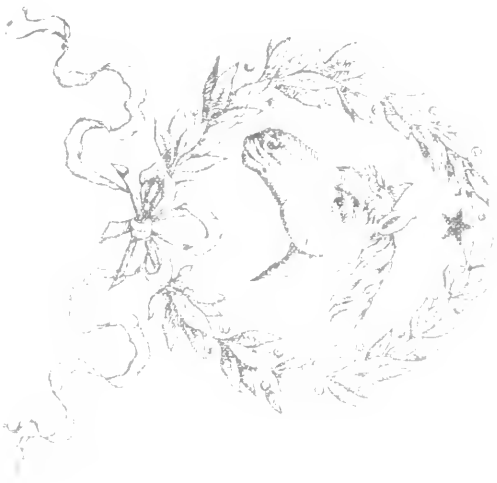

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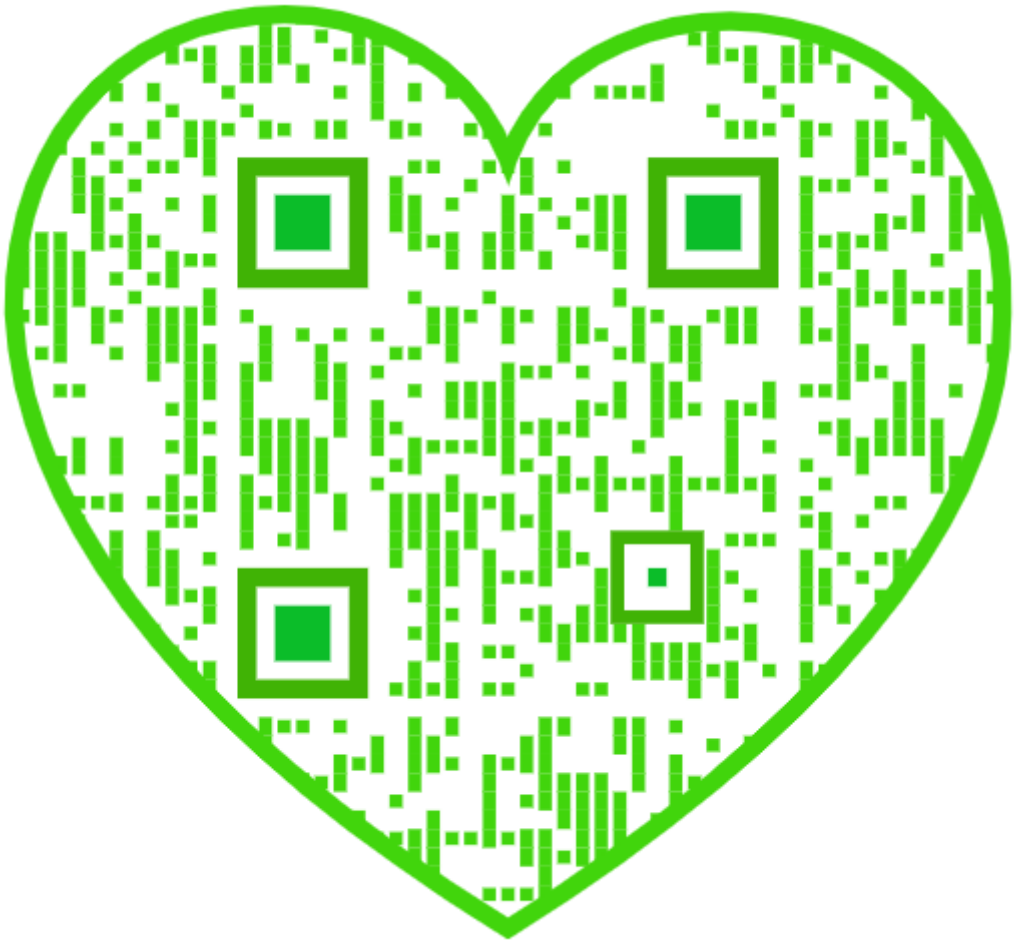

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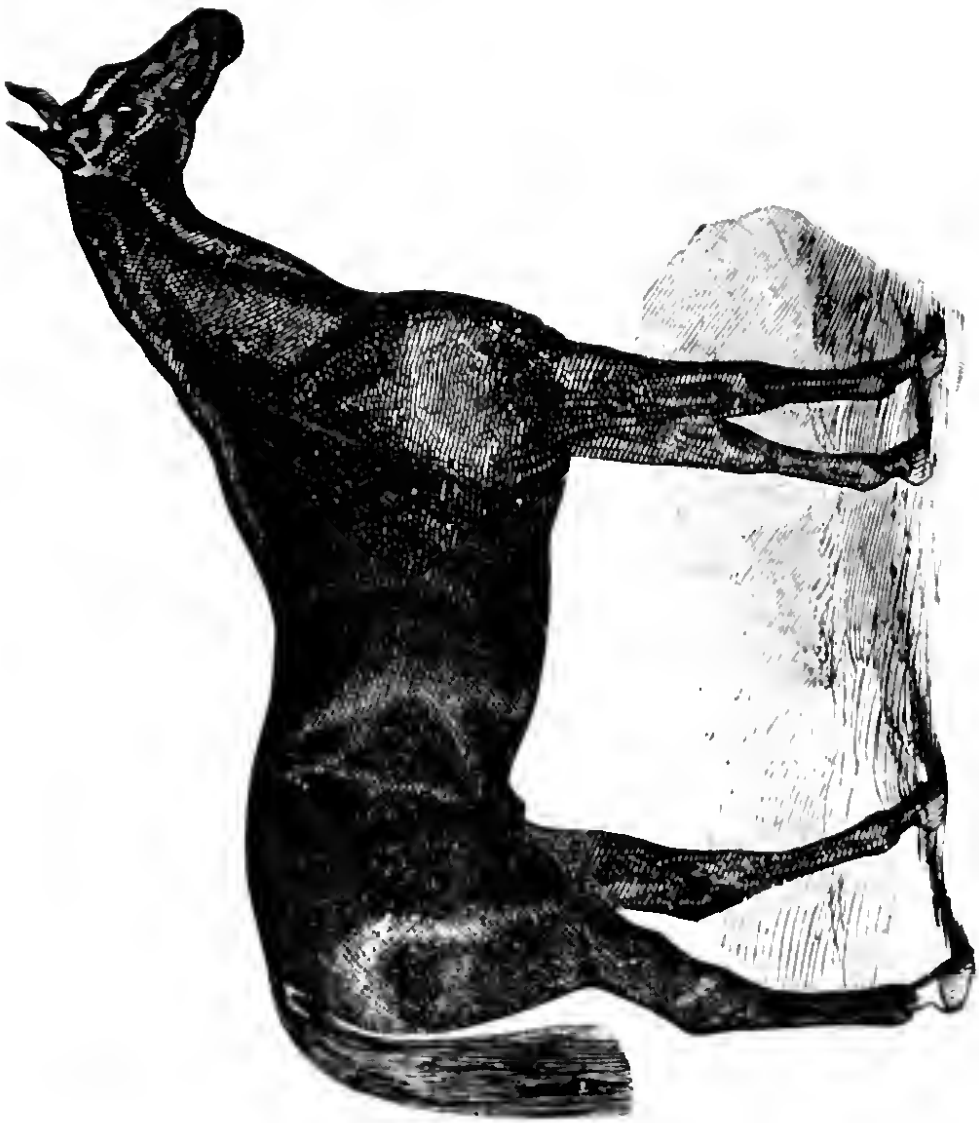

HOW TO JUDGE A HORSE

A CONCISE TREATISE

AS TO ITS

QUALITIES AND SOUNDNESS

Including Bits and Bitting—Saddles and Saddling—Stable Drainage—Driving One Horse, a Pair, Four-in-hand, or Tandem; and extracts from BAREY'S and ROCKWELL'S Method of Training Young and Obstinate Horses

BY

CAPTAIN F. W. BACH

WITH 30 ILLUSTRATIONS

NEW YORK
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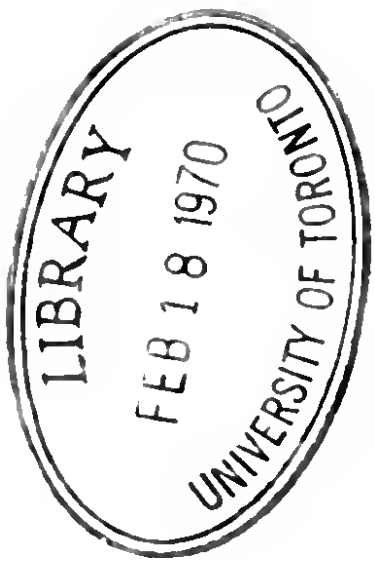

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PREFACE.

Every purchaser of a horse knows by experience how difficult it is to arrive at correct conclusions as to its *soundness and qualities*, and if he is dependent upon the opinions of others, however good the horse may prove to be, his pleasure is marred somewhat by the thought that it was not he himself who selected the horse.

Everybody loves a horse; everybody ought to study its conformation. To facilitate matters generally, it is the intention of the author of this little treatise, to assist the intending purchaser of a horse by laying down some rules concerning the *judging of horses*.

Unlike many valuable books on the exterior of the horse, *this little treatise has the advantage of great conciseness* in pointing out, in few pages, the most important guiding points for the judging of a horse, omitting a detailed description of the different ailments and their treatment.

Some points on *Rarey's* and *Rockwell's* methods of training young or obstinate horses are added, as it may become necessary for the owner of horses, especially if living in the country, with nobody near capable of handling young or obstinate horses, to break-in his young stock himself or correct those having formed bad or dangerous habits.

A few remarks, concerning how to handle the reins properly for correct and stylish driving one horse, a pair, a four-in-hand, and a tandem may be of interest to some of the readers. Also bits and bitting, saddles and saddling, and stable drainage, will be considered.

THE AUTHOR.

INTRODUCTION.

Horse-breeding in the United States, having, thanks to the efforts of public-spirited men, reached such dimensions, and been raised to a high standard of excellence, our breeders can, most favorably, compete with those of any other nation. Still, the vast expanse of our country renders it in many cases impossible for the buyer to purchase directly from the breeder. He is, therefore, compelled to address himself to the dealer, who, like every merchant, will select his goods to secure quick sales, especially because they are really an eating capital, and perhaps, more than any other, exposed to damage. The appearance of the damaged and the used-up,—some visible defect,—is far more in the way of a quick sale than inferior quality, and, therefore, is studiously avoided by the dealer. He will take good care to produce his goods to the best advantage to himself.

The fine appearance of the horse, that is, the good condition and the smooth hair, is brought about by rich and soft feed, a warm stable, careful covering, and good grooming. The whip takes care of the

liveliness of the horse and the appearance of courage and strength. It makes the horse forget all stable vices, as gripping, weaving, kicking and biting; and in mustering, causes it to exert every nerve, and oftentimes to step as it may never step again.

The dealer will take care that no blemishes are on the bones by dealing only in young horses, having done as yet no hard work, and where hereditary inclinations have not been brought to light by exertion, nor such defects developed which are a necessary consequence of faulty conformation. It is, therefore, very rare to find a good matured horse in a dealer's stable. Whoever has one will take good care to keep it, or else he will get a higher price for it amongst his friends than from a dealer, who is compelled to produce such horses on which even the would-be connoisseur can find no fault. Only large dealers, whose customers are real connoisseurs, buy elderly horses for good prices and need not care for harmless blemishes. The pretending *connoisseur* knows nothing but to find blemishes, sees everywhere spavins and galls, instead of judging the qualities of a horse according to its whole framework.

How often can we see such people turning in disgust from an eight-year Hercules and pay a high price for a four-year old, clean-legged weakling, which, after the first exacting use, may be

covered with quite more serious defects than with that little gall, which held them back from the purchase of the other horse.

The desire, though unjustified, to buy only young horses, may have its origin partly in that the age of a horse by its teeth can only be judged with accuracy up to its eighth year, and, therefore, the purchaser is afraid to buy a Methusalah, and partly in the mistaken belief that every step the horse has taken in his life be a consummation to be subtracted from its value. But, in reality, the properly conducted work, instead of causing deterioration, is a necessity for the development and strengthening of the horse's powers. The whole appearance of the animal tells better than its teeth whether it is in its decline, and as in the human race there are young weaklings in horses.

The judging of the abilities of the horse according to its proportions and the position of its legs shall form the nucleus of this treatise.

CHAPTER I.

THE SKELETON.

The horse is useful to man by its motion. The faster, safer and lasting the same, and the less the soundness of the legs is suffering from it, the more perfect it will be. The motion of the horse varies with the difference in the gait. In *walking* it moves forward with one hind leg assisted by the diagonal fore leg, whilst the other hind and fore leg support the body. This movement is executed in a slow manner, in four beats, without free propulsion. When *trotting*, the motion is in two beats, spring-like. Two diagonal legs support the body while the other two move forward. A moment before they foot, the first two leave the ground and move forward and so on. In *gallop*, both hind legs throw the body forward, almost simultaneously, and move it in a rocking motion over the still supporting fore legs. These latter are lifted the next moment, so that the whole body floats in the air for an instant. The hind legs reach the

ground first again, and support the body; quickly, follow the fore legs, and then the hind legs begin anew their forward throwing activity. The *gallop* is discernible to the ear by two or three beats.

If we consider the different parts participating in the movements of the horse, we find that there are the neck, the back, the hind legs, and the fore legs.

The *column of the vertebræ* extends from the head to the tail. The part from the withers to the highest point of the croup is destined to carry the whole rump, and its power is augmented partly by elongations of the vertebræ in an upward direction, partly by the ribs fastened to the vertebræ on both sides and forming an arch-like vault under the spinal column.

The *spinal column* consists of a uniform number of vertebræ (See Skeleton Fig. 14); the closer they stand together the shorter the column will be, and accordingly more able to carry weight. The otherwise horizontal line of the spinal column sinks downward at its forward termination to connect with the vertebræ of the neck, forming the so-called *curve of the withers*, and the more pronounced this curve the greater the carrying power. This carrying power is also dependent upon the relative positions of the two end points, or in other words upon the distance between the withers,

where the shoulders are fastened, and the highest point of the croup, for the same reason that the carrying power of a horizontal pole is greater the shorter it is. The back must appear higher in its fore part (at the withers) than in its hind part if the weight of the rump shall be equally divided between fore and hind legs, because the extensions of the vertebræ are considerably larger over the withers, not only so much as is necessary to that projection, but also to balance the aforesaid depression of the spinal curve. The higher and longer the withers the better. From the point where the latter connects with the back, the upper line should proceed horizontally. Under such conditions the passive carrying power of the back is not only a great one, but also the bulk of the muscles located on both sides of the high projections of the spinal column increase the power of gathering on the hind legs, or, in other words, the active carrying power.

A deviation from this formation we find in the *overbuilt* horse, where the line of the back mounts upward from the end point of the low withers. In this case the forward end of the spinal column rests on supports lower than those of the rear end, the weight being consequently thrown more on the fore legs. This fault will be neutralised only when an oblique shoulder and a high set-up neck facilitate

an increased freedom of action. As these latter qualities are more frequently found with mares than with horses, the disadvantage of the former being generally overbuilt is of less consequence.

If, on the other side, the fore legs stand higher than the hind legs, the horizontal line of the back will be lost to the disadvantage of the hind legs.

The spinal column will curve upward in all cases where both fore and hind legs are placed under the body, whilst the farther the horse extends its fore and hind legs, the deeper the back will sink downward, therefore, a horse at full speed will at one moment curve up its back and at the next moment unbend it again. For this reason must every faulty construction of the spinal column, deviating from the horizontal—the supports being equally high—diminish the ability of the horse to curve up or bend down its back. A back between equally high supports, but curved up by nature, is called a *hunch or roach back*. It will not admit the bending down under the horizontal line, therefore disabling horses of this kind to cover much ground in sharp gaits. But we must not mistake the hunch back for the bent-up back. Horses of a powerful short back and high swelling loins are oftentimes found to bend up their back under the rider and to unbend it only after prolonged work.

The contrary fault is the deep, and, in a higher degree, the *swayback*. Horses of this structure lack the power of carving up the back. If a long back is added to this deficiency, then it is an unmistakable sign of weakness, and the horse is not fit to carry heavy weight. In such a back the deepest point is generally in the centre. Horses of a short but deep back have the lowest point frequently right behind the shoulders, and sometimes above the loins. As weak as such a back may appear, it is more an eyesore, as such horses oftentimes show good qualities, provided their hindquarters are powerful enough to take up the increased weight thrown upon them. Horses with very weak backs oftentimes curve up the same spasmodically under heavy weight, thereby deceiving the inexperienced. Light riding, in free gaits and on soft ground, will show very soon whether power or weakness is the reason for the curving up.

The foremost part of the column of the vertebræ, which is not destined to carry weight, namely, the "*Neck*," is, through the kind of its connection with the spinal column, of high importance for the free action of the forehand. A high set-up neck is of great value, not only through the relief it gives to the forehand, but also through the favorable direction for the contraction of the muscles, lifting the

shoulder-joint, and which take their issue from the neck. But the neck must be set-up high through the *length of its vertebræ*, besides a well-formed curve of the withers.

A high set-up neck, by a flat arch of the vertebræ of the withers, gives the horse a good enough appearance, but goes on cost of the bearing power of the back.

FUNCTIONS OF THE HIND LEGS.

Considering the *functions of the hind legs* (see Fig. 14), we find that their activity in the footing, supporting and propelling of the burden, is best compared with that of elastic springs. In motion this burden inclines forward, the lower part of the spring, the hoof, is brought forward under the body to support its centre of gravity.

In this *first moment* the leg performs a swing forward around the hip-joint.

In the *second moment* the hoof foots on the ground and the leg takes up the burden.

In the *third moment* the body moves forward over the hoof resting on the ground; the upper part of the leg moves over and around the lower part of the leg. The spring acts, pushing; the more it gets relieved of the burden the more powerful it pushes the same forward, and the farther it is moved forward the

more will the spring act horizontally and spaciously on the same.

In the *fourth moment* the under end of the spring (the hoof) leaves the ground, swinging itself off elastically; the farther back, the more powerful pushing to forward; the farther under the burden, the higher throwing the same upward. Then the whole process begins anew.

Therefore, we distinguish the moments of the *extending*, the *footing*, the *supporting*, and the *propelling*.

It is apparent that the ability of the hind legs to cover much ground can only then be a considerable one, if the combination of the bones, set angularly to each other, is such as to admit not only of their stepping far forward, as also of their holding out far behind the perpendicular. The aspect presented by a well-formed hind leg in performing such a movement is composed of the following details:

(1) The leg should be raised with lightly and equally bent joints, and be placed quick and far under the body.

(2) In taking up the burden (footing) only the fetlock should bend moderately.

(3) The fetlock should rise up again light and elastic under the weight moving forward and over it, and the leg should hold out long behind the perpendicular.

(4) The propulsion, or the free swinging-off, must be light but powerful, extending and springy, neither jerk-like nor contractile, but the hoof should hold out long in the air and show the shoe, without turning over the fetlock.

All these movements should pass over into each other with ease, without making the impression of great exertion.

Let us now consider which proportions in the framework most favor the action of the hind legs.

The *spinal column* rests firm and immovable upon the haunch bones, whose foremost parts are visible in the projecting hip bones, and are ending in the ischium bones, which form the posterior parts of the haunches. Between the hip and the ischium bones, but considerably nearer the latter, the haunch bones have on either side a socket, in which the head of the thigh bones are inserted.

This latter bone it is which moves the whole hind leg attached to it, forward and backward. The wider the circle described by the thigh bone around its centre, the further can the hoof be placed forward under or backward behind the body. The most room for the placement of a long thigh bone will be under a haunch lying nearly horizontal, but its lower end, the stifle-joint, should not transgress the vertical line from the hip to the ground.

The *length of the haunch bones*, determining that of the croup, can never be too large, because with this length increases not only the length of the thigh bone, but also the distance of the hip joint from the hip, and also from the point of the ischium. With the largeness of these dimensions grows also the space for the development of the most important muscles for the extending and propelling power of the hind leg; besides developing a more favorable condition for the contractile power of the muscles between their two fastening points. The angle formed between haunch and thigh bone varies between 80 and 100 degrees. In the stifle-joint the thigh bone is connected with the leg bone, under an angle of about 120 degrees. Hip and stifle-joint together are generally called the "haunches," and the pliability of these two joints is called "the contractibility of the haunches."

The *haunches*, as well as the *thigh bone*, are, on their surfaces, covered with so many powerful muscles that their structure and connection can only be judged by the formation and the length of the croup and the position of the stifle-joint. The location of the latter is of great importance, as it enables us to draw a conclusion as to the length and obliqueness of the thigh bone. A well-formed stifle-joint reaches with its forward point near to the perpen-

dicular line from the posterior point of the hip to the ground, and looked at from behind, its position must appear so far outward that the horse looks broader there than in the hips (Fig. 10*a*). While the haunch and thigh bones are enclosed by voluminous muscles, and consequently their outlines can be only indistinctly traced, the position of the lower parts of the leg are easily discernible.

The *leg bone* is connected at its upper end with the thigh bone through the stifle-joint, at its lower end with the shank bone through the hock-joint. The leg bone is, likewise, especially in its upper parts, clothed with powerful muscles, which, in connection with those of the thigh bone, are called "the hose." Every bone of great length, and surrounded by muscles, has the advantage of the muscles affixing themselves in larger quantities on the same, therefore adding, through its greater length, to the energy of the motions. The same is the case with the leg bone. The favorable formation of a good thigh bone will, therefore, be completed by a long leg bone. Such a leg bone finds only room under a stifle-joint placed far forward and outward, from which it runs in an oblique direction from forward and outward to backward and inward, to connect in its lower end through the hock joint with the shank bone. The limit to which the leg bone may extend

downward and backward must be the result of the conditions under which the position and angular conformation of the hock joint answers best the laws of burdens.

The position of the hock joint should be such that its posterior end, the hock lever-bone, shall just be met by a lot from the ischium bone, and that this lot should run down along the shank bone. Viewed from behind, the hock joints should come closer together than the stifle-joint. The joint, besides showing sharp outlines, must make the impression of massiveness; and not only the cross-section should be considerable, but also the extension from front to rear, as seen from the side. This latter dimension depends principally upon the length of the lever-bone, as representing the common lever for the action of the muscles of the hose, and, therefore, for all the propulsive powers of the hind legs.

The shank bone should show a perpendicular position and appear quite broad when looked at from the side; the cords on its backside must appear sharply separated from the bone and from each other. The shank bone, serving only as a support, and not as a fastening place for the muscles, is only then favorably formed, if it is as short as possible.

In the *fetlock or upper pastern-joint* the shank bone should be connected with the fetlock under an angle

of 140 degrees. The small pastern and the coffin bone follow in the direction of the fetlock bone, and are connected by equally named joints. The lower part of the small pastern bone, the coffin joint and coffin bone, are encased in the hoof.

On the *length of the fetlock bone* depend considerably the speed, elasticity and extent of the steps. A long spring develops a more telling force than a short one, whereas the latter can stand a greater pressure. Likewise the long fetlock has the greater elasticity, while the short one will carry a heavier weight. The fetlock must be formed according to the demands of either elasticity or carrying power, but the elasticity must always be in proper relation with the length of the former. The long elastic fetlock of the race horse and the short, hard fetlock of the draught horse are both good in their place. The long, soft and relaxing fetlock is bad with any animal; it will succumb under the burden without producing any elasticity. The short, straight fetlock, bare of any springiness, ruins joints and ligaments.

FUNCTIONS OF THE FORE LEGS.

Let us now consider *the functions of the fore legs*, and we find a repetition of the four moments we had to distinguish in the hind legs, viz., the *extend-*

ing, the *footing*, the *supporting* and the *propelling;* but there is a decided difference between fore and hind leg in the second and fourth moments, viz., the footing and the propelling. The fore leg exerts its greatest power in the moment of footing, a minor one in the moment of propelling (or swinging-off), the contrary being the case with the hind leg.

At the *second moment* the fore leg has to take up almost the entire force of the concussion produced by the weight in connection with the motion, to prevent the body from turning a summersault; but at the *fourth moment* the fore leg cannot do much in the way of tossing the burden forward, because its elasticity is not transferred to a firm basis of bones of the rump, but is reduced to a minimum by being connected with the side part of the chest by muscles only.

The conditions under which the fore legs fulfil their task best are easiest observed in the trot.

The general points for a fine action in the trot, are:

(1) Light, free and high raising of the leg from the shoulder with well-bent knee; far, light and powerful extending from the shoulder; gradual stretching forward of the parts underneath the knee, so that the leg looks straight only when the hoof touches the ground.

(2) Footing on the full hoof.

(3) Long holding out of the leg behind the perpendicular.

All these moments of the action should pass over into each other with ease, and should not show any interruption; they should be elastic, without making the impression of exertion or convulsive strain of the muscles.

Let us now examine the *construction of the fore leg.*

The *shoulder-blades* encase and support the chest in its forward part on both sides, and are only fastened to it by muscles and the outer skin. Their motions are upward and downward around a pivot, located about four fingers below their upper edge; consequently the upper part of the shoulder, above that pivot, will move backward and downward, when the part below the pivot moves forward and upward. This motion of the upper part of the shoulder is interfered with, should the saddle be shifting forward. High and sharp withers, preventing such shifting of the saddle, are an indispensable quality in a saddle-horse. Besides this movability of the shoulder forward and backward, it has a very slight capability for sideward motions, though limited.

The flexibility of the shoulder is the cause of the horse's ability to lift his fore legs considerably with-

out the spinal column abandoning its horizontal position, or without molesting to any degree the hind hand with the weight of the forehand thereby reducing its propelling powers.

At its lower end, the shoulder-blade is connected with the *arm bone*, through the shoulder joint, under an angle of 80 to 100 degrees.

Shoulder blade and arm bone in their relation have much similarity with the thigh and leg bone of the hind leg. What is said about the position of these two latter bones and their combination holds good also for shoulder blade and arm bone. The shoulder must be long and oblique, which is only possible if its upper and rear edge reaches far back at the side of the withers. The arm bone also must distinguish itself by considerable length and an oblique position. Under these conditions both bones are jointed under a right angle. The shoulder joint has then a large opening capacity, and, the length of the bones being considerable, the faculty of extension of the leg is a great one. Furthermore, between these two long bones the masses of muscles can accumulate in larger proportions and receive the most favorable direction for action. The main stress in judging the upper part of the fore leg is always to be laid on *the oblique direction and length of the arm bone*. If these qualities are there, the leg is

capable of extending itself far forward and holding out far backward behind the perpendicular, though the shoulder may be a little longer or shorter.

A short shoulder by excellent length of the arm bone we find in all animals, which by a high location of the shoulder joint, distinguish themselves by superior swiftness—as greyhounds, deer, etc. The examination of horses, which by great freedom of shoulder show extraordinary speed, proves that they frequently have a very oblique—not a long-shoulder, but a very long arm bone; whereas the defect of a short arm bone cannot be counterbalanced by a long and oblique shoulder; the long and far-reaching steps out of the latter, consequently disappears, and only the high action is left. A shoulder only long, but without obliqueness, may become detrimental, the shoulder joint being placed too low down. Furthermore, it must be taken in consideration that the shoulder-blade forms the basis for the neck, which will be set up higher, the more oblique the shoulders are; but, on the other hand, will appear broader and more projecting, the straighter the latter are. The farther the head and neck are projecting, the farther is the leg compelled to step forward to support the weight; but, with a straight shoulder, this is impossible, although very necessary. With the length of the steep shoulder, the basis of the neck

becomes broader, and the weight of the latter grows larger. The fastest, and so very shoulder free race-horses, have the thinnest necks.

The *elbow joint* connects the arm bone with the *fore arm*. This latter consists of the fore arm bone and the elbow bone; the latter, with its elongation, called the *lever of the elbow*, extending considerably beyond the rear part of the elbow joint. On this lever are fastened the extensor tendons, emanating from the shoulder-blade, and acting on the elbow bone when the leg is supporting or pushing the weight forward, like on a one-armed lever, the prop resting on the ground, and the weight to be lifted and moved on the elbow joint. The extending activity of the muscles on this lever comes especially into play, as the leg pushes the weight forward. This activity becomes, then, of the same importance for the fore arm, as the united activity of the muscles of the hose and the extensors of the hock joint for the hind legs, namely, as a pushing and elastic power. For this reason has a long projection of the elbow the same advantages of a long lever, as the lever bone of the hock joint. A long projection of the elbow has the further advantage of granting the necessary space for the full development of the muscles of the fore arm, which rest partly on the former, and, in which case, the upper part of the fore arm,

seen from the side, makes the impression of imposing width.

Great length of the forearm, as a bone enveloped by muscles, adds considerably to the execution of powerful movements of the lower parts of the leg. At least a *short* fore arm in a long leg is at all times an unfavorable formation, brought about by a too great and injurious length of the cannon bone. For the dimensions of the cannon bone, the fetlock, etc., the same rules are decisive as on the hind legs.

Comparative value of the different bones and joints. (See Fig. 14.)

If I said that the importance of the shoulder blade and arm bone for the movements of the fore leg be equal to that of the thigh bone and leg bone of the hind leg, I find myself seemingly in contradiction with the usual opinions, viz: that the shoulder is as the haunch bone of the fore leg; that the arm bone corresponds with the thigh bone, and the fore arm with the leg bone; and that, therefore, the elbow joint has a similar relation to the stifle joint, and the elbow to the stifle. From an anatomical standpoint, these views may be correct; but viewing the different bones and joints from the standpoint of the movements and performances executed by them, we will come to a different opinion. For instance, the movements of the arm bone are not the same

as those of the thigh bone; the elbow joint is not in the same relation for the forward movement of the fore leg as is the stifle joint for the hind leg, its chief activity coming into play during the act of pushing forward.

If we look at the different bones and joints of the haunches, we find that the thigh bone corresponds with the shoulder-blade of the fore leg, the leg bone with the arm bone, etc.

The *shoulder-blade* lies parallel with *the thigh bone* (Fig 1[a], page 29, a and *a'*), and their motions, in extending the legs forward and in pushing forward, are precisely in the same direction, though the shoulder-blade is less movable, different in form, and, at its upper end, fastened only to muscles and not to a socket like the thigh bone. But these are modifications brought about and justified through its cramped but otherwise safe position at the vault of the chest. The very movable shoulder can never be compared with the totally unmovable haunch bones. These latter enclose the internal and posterior cavity of the rump in the shape of a firm bony ring, similar to the ribs, enclosing the organs of the chest, a task which the shoulder-blade has nothing to do with. This firm ring of bone could go in close connection with the thigh bone; the movable and less resisting ribs could form a union with the uppermost bone of

the leg (the shoulder-blade) only on a broader basis and in an elastic manner; a flat bone of the shape of the shoulder-blade only being fit for that purpose.

Between arm bone and leg bone (Fig. 1[a], b and *b'*), running likewise in the same direction, the similarity, also in regard to shape, is a larger one. At the upper end of the arm bone the cartilaginous roller for the flexor tendon of the fore arm represents the stifle of the hind leg. The lower end of the arm bone forms a joint, on the backside of which the lever of the elbow presents exactly the same lever as on the hock joint (c and *c'*).

The two bones connected by the knee joint, the *fore arm* and *shin bone*, run both in the same perpendicular direction as the *shank bone* of the hind leg and represent together (taken as supporting bones) the shank bone of the hind leg (d and *d'*). In every position—forward or backward—which the fore leg assumes in supporting, both these bones always represent a straight line, one supporting column, in which function the joint in the knee may be considered as not existing. The knee joint should not be movable if under weight, and it also shows no lever projections on which muscles could produce powerful actions. The joint must, therefore, be considered simply as a ruption of the straight

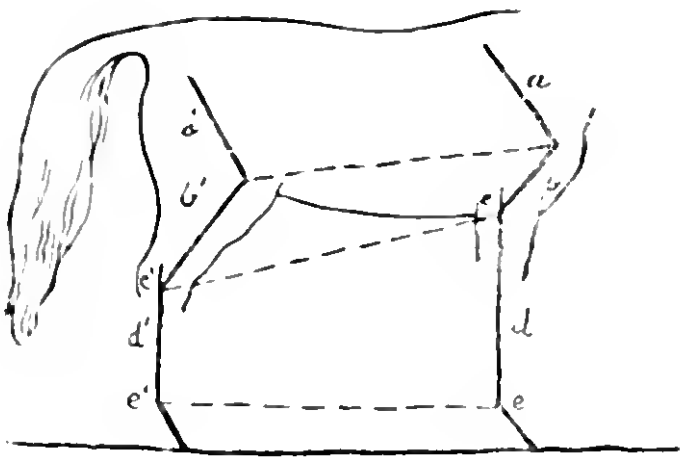
column, existing only for the purpose of facilitating a contraction of the leg while bringing the same forward. If this contraction, between fore arm and shin bone were not possible, if both would present one uninterrupted piece of bone from the elbow down to the fetlock joint, the foot in moving forward would continually strike against obstacles on the ground. For this reason the knee joint is indispensable. It has no other essential task, but to facilitate a reduction of the whole length of the leg. It is perfectly justifiable to consider the shank bone of the hind leg, during the period of supporting, equal to the whole column from the elbow down to the fetlock.

If we consider, in this manner, the forearm as an upward extension of the shin bone, then the elbow joint corresponds with the hock joint, the shoulder joint with the stifle-joint.

The principal points, in comparing the different bones and joints, should always be the similarity of their movements. The shoulder joint and elbow joint control all the extensible movements of the fore leg, in the same manner, as the stifle joint and hock joint govern those of the hind leg. Particularly pronounced is the similarity of the actions, if we observe the effect of the muscles on the levers during the supporting and propelling activity of

both legs. The same effect which the muscles of the hose, in connection with the Achill-chord, perform on the lever of the hock, the extensor tendons will perform on the lever of the elbow. The muscles of the hose draw the lever of the hock toward the thigh bone, and, the thigh bone being simultaneously moved backward by the muscles of the croup, all the upper joints will be opened.

FIG. 14.



This sudden extension of the leg represents the propelling activity of the hind leg, the hock joint forming the near and the ground the more remote fulcrum. The same is the case with the fore leg. The extensors acting on the elbow, at the same time the shoulder joint being opened at the front side by the long flexor of the fore arm, the same sudden elonga-

tion of the whole column takes place, and, with it, a tossing, elastic action, though, on account of the shortness of the angularly connected bones, with less force than that produced on the hind leg.

The elbow joint must, therefore, be considered as the hock joint, that is, the spring joint of the fore leg. With the stifle-joint it has nothing else in common, except being in position of nearly equal height on the rump, the necessity for which there are other reasons. The knee cannot be compared with the hock, because a spring-like action can never be produced by a joint, which, while the leg is in the moment of supporting, permits no considerable angular variations between the connecting bones. For the better understanding of these facts, the drawing (Fig. 1[a]) is added. The corresponding joints: shoulder and stifle joints, elbow and hock joints, and the two fetlock joints are connected by dotted lines, while the various bones of equal value are marked by letters: *a* and *a'*, etc. Especially observe the two lever projections of the elbow and the hock (*c* and *c'*) so as to become convinced that it is from there that the propelling and the tossing power of the muscles for fore and hind leg is developed in exactly the same manner; and that the comparison of the respective parts of the legs is correct.

THE ANGULAR COMBINATION OF THE BONES.

Thus far, we have considered those qualities of the skeleton of the horse, bearing relation to the extension and safety of its movements. Now let us discuss those qualities necessary for the preservation of the limbs.

The limbs are exposed to the most violent shocks. Not only the weight of the horse's own body, but also that of the rider, falls on them at every step, and with an increased force in sharp gaits and in jumping. The starting point of these shocks is the ground. From there the rebound meets first the hoof, and passes upward, diminishing in force, over the whole column. The bones, joints, and sinews nearest the ground suffer most, as is proved by the overwhelming number of lamenesses occuring on the lower leg. Furthermore, the rebound is the more destructive, as our hard roads make shoeing an imperative necessity, thereby diminishing the expansive power of the hoof. The force of these jerks and shocks is broken by the angles under which the different bones are jointed together. The majority of the joints transmit the rebound only partly to the higher bones. The ligaments and sinews transmit a large portion of the shock to further removed points of the column. On the upper part of the

limbs, we find the longest bones; the angles formed by them the narrowest, and the connecting joints the strongest. Where the connections are the straightest, as in the lower parts, which are most exposed to the concussions, there we find, for the purpose of diminishing the concussions, three joints in the distance of a span of the hand, viz.: the upper and lower pastern and the coffin joint.

With the advantages of a narrow angular formation, grow also the extending ability of the limbs, and the space for the development of powerful muscles, as we have seen above, thereby making the mechanical proportions the most favorable. We find very favorable angular formations principally in the exquisite structure of the race-horse: the long fetlock, the oblique thigh and armbone, etc., enabling the horse to cover much ground, and to exhibit extraordinary staying power, and at the same time protecting it against hard concussions. The low bred horse, on the contrary, is characterized by the straight formation of its limbs, short and unelastic action, and by showing the effects of great exertions, oftentimes by inflammation of the joints.

On the other side, the oblique position of the long bones has also its limit in the reduction of the carrying power. The more favorable the angular formations, the greater the demand on the ability, espe-

cially on the firmness of sinews and ligaments, therefore the acuteness of the angles should not transgress certain limits. A disproportion is oftentimes found in the half-breeds, where the long bones, an inheritance of one parent, do not receive the necessary support from the loose fibres from the other parent, producing crippled limbs within a short time.

Riders, without judgment, often taking the increased carrying power and hard inelasticity of the straight formations for signs of strength, attack and ruin the joints quickly; sometimes they consider the elasticity of the favorable formations as weakness and are afraid to touch the animal.

If we find a deviation from the normal, one joint too straight, another too oblique, the latter will have to bear the concussion intended for both. In a horse standing straight in his hocks, the fetlock joints will receive, in an increased proportion, the shock from the burden. Also, a horse, straight in the haunches (hip- and stifle-joints), but very oblique in the hock joints, will suffer in the latter.

The fore leg, the angles of which, between shoulder blade and arm bone, and between arm bone and fore arm, are summarily narrower (as on the hind leg the angles between thigh bone and leg bone, and between leg bone and shank bone), receives, through the mus-

cular connection between shoulder blade and chest, the benefit of greater elasticity against the effects of the rebound. But, nevertheless, the latter has a stronger and more destructive effect on the fore leg, being nearer the centre of gravity and eventually burdened with the weight of the rider. Horsemanship is eagerly bent on attaining a greater development of the muscles of the back, an increased employment of the hind legs, for the purpose of reducing the weight of the fore hand.

It is an important part of the examination to see whether the limbs are correctly jointed; and, by deviations from the normal formation, whether those joints, being more severely taxed, are built sufficiently strong to offer increased resistance.

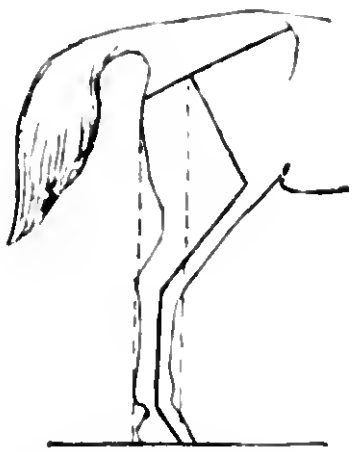
Just as the above-mentioned irregularities may act destructively upon the neighboring joint, so it is with all irregularities of the structure. Perfectly built animals do not exist. It is interesting to observe how irregularities are multiplied by other irregularities, or again counter-balanced. The combinations in this way are innumerable. Let us now consider some of them.

THE POSITION OF THE HIND LEGS.

The rump of the horse is supported by four pillars, whose portability is fixed by mechanical laws

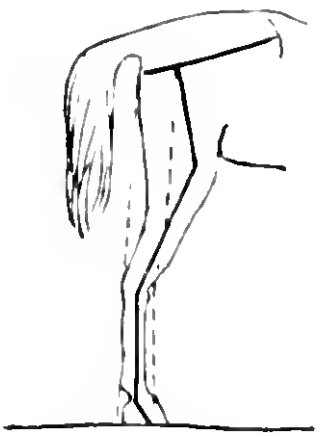
The most favorable support is established by placing the basis under the weight in the direction of its gravity. In other words, the basis of the hoof, on the ground, falls perpendicularly under the hip joint. No exception is made by this pillar, being angularly composed, not straight. The location of the hip joint, being pretty well hidden, at least only definable by the aid of anatomical knowledge, this point is not available for common use to form a correct idea of the perpendicular position of the leg over the basis of the hoof. We select, therefore, the posterior end of the haunches, the point of the ischium bone, and drop a line to the ground. If this perpendicular just touches the point of the hock, and from there is running down the back of the shank bone, then the hip joint will be nearly per-

FIG. 1.



Normal Position.
Good Angular Formation.

FIG. 2.



Normal Position.
Bad Angular Formation

pendicular over the toe of the hoof. This position of the hind leg is called the *normal.*

From this normal position, there are deviations in two directions. In many cases the hock joint falls forward of this perpendicular, but, more frequently, it falls behind the same. The first irregularity we may call the *under-standing*, the second, the *back-standing* position.

It is apparent, that, with this change of basis, there must be connected a variation in the weighting of the joints, and that the column is not supported in itself. The perpendicular weighting creates, under these circumstances, a pressure on the whole column in a direction, causing the same to fall over—in the *under-standing* position to backward, and in the *back-standing* position to forward. The balance can only be preserved, if the leg, through its muscles, employs such forces of traction and pressure as to counteract the intention of gravity to overturn the column.

In the *under-standing* position of the hind leg, the uppermost point of the column, viz.: the femmral head of the thigh bone, has a tendency of falling backward (Fig. 3); therefore, an opposing power must be employed to enable the leg in this position to fulfil its task as a supporter. For this task, the whole group of muscles of the hose is qualified as

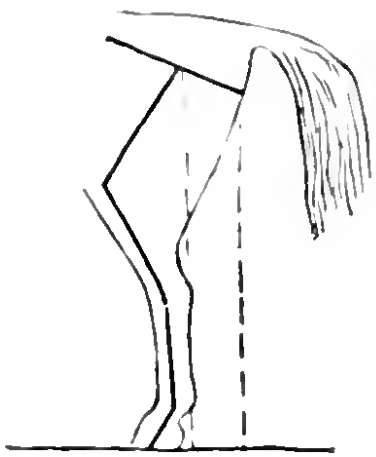
being also in close connection with the flexors running downward on the rear side of the hock and fetlock joints. An increased traction of the muscles, and, consequently, an increased tension of the above-mentioned flexors, has to neutralize the deviation in the position. On the other hand, such permanent and increased tension of the sinews will make itself felt in its consequences, and in the course of time by a straight position of the fetlock. It is apparent that an increased and continual activity of the flexors must take place, not only at rest, but also in motion, because, during the latter, the leg is constantly placed farther forward under the body, than in the case of the leg being jointed normally.

For this latter reason, horses of this build perform the very gathered paces and short stops with ease, but the holding out of the leg behind the perpendicular will suffer, viz.: the propelling and the springing power—the extensibility will not be equal to the carrying capability. Such horses will never be prominent, neither in a fast trot nor in running, and will bring little pressure into the harness. The direct cause, of this position of the leg, is the abnormal angular formation of some joint in connection with an abnormal length of the bones enclosing that joint. All the different combinations cannot be exhaustively discussed on account of their magnitude,

because each bone, taken for itself, or in connection with another, may be the cause. But, it is of great importance, for the judging, to distinguish two forms of the under-standing position, according to the bones of the upper or the lower leg being the cause. In the first case, the disadvantages are not great ; in the second, quite considerable.

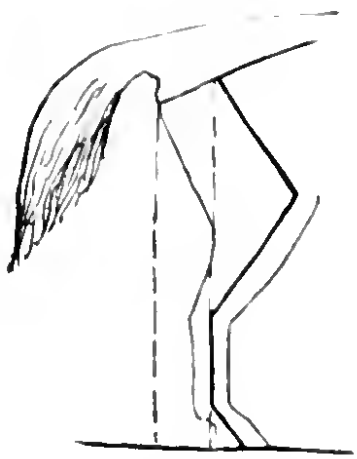
If, through the extra length of the thigh bone, the stifle-joint is placed far forward, but the leg bone is short, and the hock joint straight, then we get the *under-standing* position, as in Fig 3. But here the adversity of the straight and unelastic hock joint is nearly compensated by the favorable length and the the considerable elasticity of the thigh bone. Such

Fig. 3.



Under standing Position by Excellent Thigh Bone, but Straight Hock Joint.

Fig. 4.



Under-standing Position Caused by the Stifle-joint Being Placed Far Forward.

horses are quite able, though a little hard in their motions.

Also the case, in Fig. 4, where the exquisite length and obliqueness of the thigh bone of itself alone produce the under-standing position, while the other joints are normal, is to be judged favorably.

But, if the thigh bone is short and the stifle joint stands straight, the ableness of the leg will under all circumstances be inconsiderable. The insignificant flexibility of the upper joints throws the weight, in an increased proportion, upon the lower joints. In the case, represented in Fig. 5, the oblique direction of the shank bone will increase the under-standing position still more, at the same time narrowing the angle of the hock joint, to the injury of the latter. Only the short radius of motion, permitted by the straight and short thigh bone, can save the hock joint from too frequent injuries.

Fig. 5.

Under-standing Position Caused by a Short Leg Bone and Defective Direction of the Shank Bone.

The back-standing position of the hind leg is perceptible in that the line from the ischium bone does not meet the posterior line of the hock and the shank bone, but is running down in front of the same.

In this case, the leg is also not balanced in itself, but has to employ active muscular powers to establish equilibrium. But different muscles and cords, acting in a directly opposite direction from those in the under-standing position, must be brought into requisition: therefore, the extensors will be strained permanently and to a high degree. This must also take place in motion, leading, finally, to a reduced capability of the extensor tendons for the movements of the leg forward. The legs cannot be placed sufficiently under the weight, and will, therefore, not be able to give the horse the necessary support in short paces and stops.

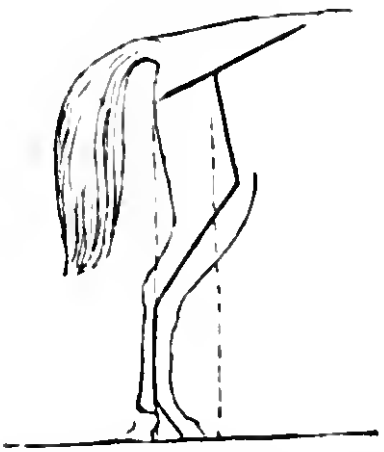
The direct cause for the back-standing position may be traced to a defective position, or unproportioned length, of some bone. Which bone or joint at fault is very essential, for the criticism of the defect. It may be set down, as a geneal rule, that the defect is most serious if brought about by insufficient length and steepness of the thigh bone, as in Fig. 6.

If the thigh bone is long and oblique, while the main defect exists in a too great length and obliqueness of the leg bone, as in Fig. 7, then the formation is only unsightly, but the leg is well able for exertions especially in sharp paces. The whole column is very extensible, the leg can be stretched far back-

ward and the muscles of the haunches furnish a great propelling power, as can be observed by so-called bow-legged horses; but the weight affects the two pastern joints, which frequently collapse downward and backward.

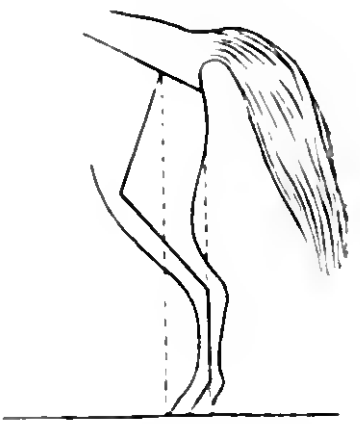
In judging the different positions, it will be observed that the normal shape is not at all decisive for the working ability of the leg; because, the correct position can exist, even in a very badly formed and unable leg. Fig. 2 shows how, in a leg composed only of short and straight angled bones, and without any ability for extension, the perpendicular position may be found.

FIG. 6.



Back-standing Position, Caused by Bad Location of the Stifle.

FIG. 7



Back - standing Position, Caused by Great Length of the Leg Bone.

THE POSITION OF THE FORE LEGS.

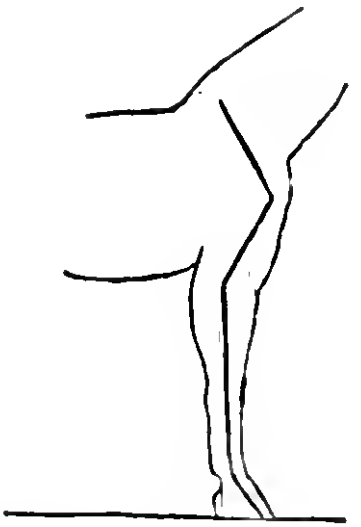
The uppermost part of the fore leg not being inserted in a firm bone like the thigh bone, but

offering, with the whole inside surface of the shoulder, as far down as the elbow, fastening points for the connecting muscles, the position of the highest point of the column to the basis of the hoof, is not of so much concern as in the hind leg. It will be pretty near correct, to consider the elbow joint as the chief supporting point for the rump, and its position as deciding. In the normal position, the elbow joint stands perpendicularly over the fetlock joint, and generally a line from the shoulder joint will meet the toe of the hoof. If we examine the deviations from this rule, we will find them to be in two directions. In the *fore-standing* or stretched position, the fetlock joint falls forward of the line from the elbow joint; in the *under-standing*, behind the same. In the first case, the foot stands too far forward; in the latter, too far under the body.

In judging the *fore-standing* position, we will find that all muscles and sinews, located on the rear side of the leg, not only including the flexors of the lower leg from the knee down, but, also, the extensors acting on the elbow lever, have to work and carry weight in an increased proportion; the consequence being that horses, with this formation, frequently strain their sinews, especially if the fetlock is very long. This defect will be augmented, if the leg is *calf-kneed*—that means, if the knee stands be-

hind the line. At all events, the *fore-standing* position is by far more injurious in the fore leg than the *under-standing* in the hind leg. In all the different gaits, the fore leg has to exert its greatest activity, and is most imperiled, while being stretched forward and in taking up the burden. But, it is apparent, that this position must increase the force of the weight and the danger of overburdening the sinews.

Fig. 8.



Fore-standing, Connected With Calf-Knee.

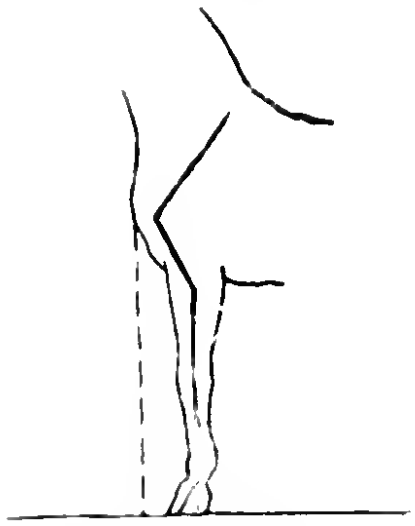
The *under-standing* position is, under circumstances, a defect without consequences—more of an eye-sore—but may become a serious blemish. The consequence of this position is, generally, a protruding crooked knee, less visible in young horses, but more developed in older horses, even to *buck-knees*. If, with the *buck-knee* is connected a long and elastic fetlock, and a long arm bone (Fig. 10), then such horses are quite fit for any service, and go safe.

If we only find a crooked knee, while the fetlock is short and straight, as in Fig. 9, then they go very unsafe and are not fit for saddle use.

THE PROPORTIONS OF FORE AND HIND LEGS.

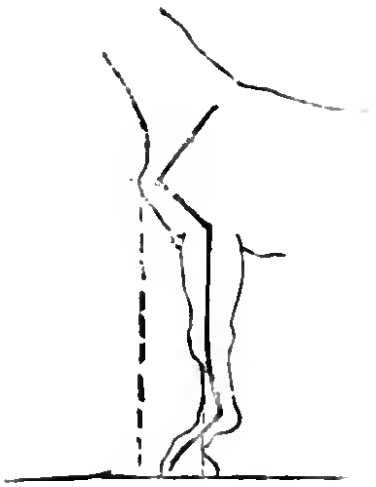
To facilitate a regular movement of the fore and

FIG. 9



Under standing Position, Accompanied by Short Fetlock and Arm Bone.

FIG. 10.



Under standing Position, Accompanied by a Long Fetlock and Arm Bone.

hind legs, and to regulate the reciprocal effects of the forces, it is necessary that their ability for extending, propelling, and tossing-off should be equally great. Only harmony in the movements can secure endurance. It is better that fore and hind legs possess equal qualities in motion, if ever so little, rather than have no harmony. Not for every purpose, do we need fast horses, or horses of great strength. Agricultural purposes, for instance, require a horse with enduring qualities, with very moderate speed and medium strength —an animal whose frame warrants limited motion, but endurance. Imprudent experiments to improve the race, have often been the cause of disturbing the harmonions build

of the farm horse. Experience in breeding shows that the foal inherits parts of its form and constitution from the sire, and parts from the dam, but there is no possibility of predicting the proportions. It can happen that the product of a high bred sire and a common mare possesses a free and elastic action in the fore hand, while the hind hand is weak and trailing, leaving the former unsupported—in front as a lion, behind as a cow. Likewise may the nobler of the parents transmit the long and oblique shoulders upon the foal, and, the common one, the flabbiness of the fibres of the muscles and sinews. The noble part of the inheritance can only be propelled by powerfully contractible muscles, and supported only by firmly organized chords and ligaments; but the flabby ligaments are not able to protect the angular joint connections. In such cross-products, we have an opportunity to observe, that, while they may show a wide step, they lack energy in the propulsion. Also, we may observe how ligaments and chords of the narrow angled joints suffer under the increased pressure, and how, after light exertions, all sorts of blemishes appear on the bones. Even, if the energy of the nobler part has been transmitted unimpaired, we see the other inheritance, the bad foundation, succumb under the too great demands of the former.

If there exists in the formations a disproportion between fore and hind hand, the question arises, what kind of service will be required of the horse? For the carriage horse, a small superior roominess of the action of the hind legs will do no harm as it favors propulsion. For saddle use, such a horse is unfit, as, in this case, the fore hand is naturally overburdened, and will be quickly ruined. Only in exceptional cases, where powerful loins permit a transmission of the burden upon the stronger hind hand, the condition of the fore legs may be preserved by careful riding. Otherwise, it is better to select for saddle use, a horse with less speed, but whose fore and hind hand are in perfect balance.

The incorrect positions of the fore and hind legs, as we have seen before, combine in their relations as follows:

(1) If both fore and hind legs are placed backward, the animal will easily lose its balance forward, will produce much pressure forward, but will be unsafe. It is only fit for draught, and will ruin its fore legs.

(2) If fore and hind legs are placed forward, there will be but little propulsion. It will be a moderate carriage and a slow saddle horse.

(3) If the fore legs are placed backward and the hind legs forward, that is, if all four legs are under

the body (produced by faulty formation of the angles, but also occurring with hunchbacked horses), then the animal is unsafe as a saddle horse, has not the necessary propelling capability for a harness horse, and will "forge."

(4) If the fore legs are placed forward and the hind legs backward (produced by bad formation of the angles, but also by considerable swayback), then the animal, whose fore and hind legs seem to act separately, is entirely unfit for saddle use and is only a very poor harness horse.

THE EXAMINATION OF THE HORSE FROM THE FRONT AND FROM BEHIND.

Thus far, we have examined the horse from the side. Let us scan it now from the front and from behind. As difficult as it is to express in numbers the proportions of a horse's body, so difficult is it to say how broad a horse should be from shoulder point to shoulder point, and from hip to hip. The limits for greater width lie in the growing weight of the rump, and in the disadvantages for the movements, as we will see later on. The limits of the narrow formation are fixed by the insufficient space for the chest and the vital organs enclosed therein, destined for respiration and circulation, as also by the insufficient width from hip to hip, thereby offering

insufficient play-room for the muscles of the hind-quarters to the special disadvantage of the motive power.

Under all circumstances, a horse should be equally broad in front and behind, and the front and hind hoofs should stand equally apart. In motion the legs of the same side should cover each other, and move parallel and at equall distances from an imaginary plane laid vertically through the spine.

In all paces there is a more or less swaying motion of the body from side to side, as the different legs take their turn in supporting the weight. It is conceivable that, in slow gaits, especially in the walk, these swaying motions will take place in an increased way, and also, that the farther the legs are set apart, the farther sideward they have to push the burden, so that by great width of the frame, the motion of the animal must become swaying from side to side. But, through these swayings, time is lost for the forward movement, therefore speed must suffer by great width of frame. On the other side, the broad formation causes a safe basis, and the body will not easily lose its balance sideways. It affords safety in the turns and makes it easy for the animal to balance its own and the rider's weight in the stops and in gallop.

In the narrow frame these deviations to the right

and left are diminished, but the roominess of the motion is increased. Narrow built horses are easily thrown off their balance, and, therefore, offer less safety in turning; but they carry the turns out shorter and easier with the assistance of the displacement of the weight of the rider. It is very difficult for such horses to balance the weight in gallop and in stopping.

Deviations from the normal width between fore and hind hand occur in the following combinations:

(1) *Broader behind than in front.* If the difference is not too great, it has the advantage that, in the gallop and in stopping, the burden is supported on a broad basis, and that, in running, the hind legs pass by easily on the outside of the fore legs; but, the chest being narrower, the saddle will slip forward on such horses, and the fore legs suffer frequently by their not balancing the weight properly, especially in the trot.

(2) *Broader in front than behind.* Here we find, besides the already mentioned disadvantages of the narrow formation, the very serious defect that the hind legs cannot pass by the fore legs, and that, in sharp gaits, injuries to the latter are unavoidable. These horses are not fit for saddle use.

Sometimes we find horses, though proportionately built in this respect, that do not follow with their

hind legs in the direction of the fore legs, but swerve with both hind legs to one side. They travel like a dog, placing the axis of their motion diagonally to the line of travel. The cause is either great weakness or pain in the back. But, let there be no misapprehension, many horses, from pain in the jaws, do the same thing, when under the saddle, but, when led by hand, go straight.

The position of the limbs, seen from front or from behind, should be perpendicular throughout, so that the hip joint of the hind leg stands perpendicular over the basis of the hind hoof, and, the elbow joint of the fore leg, over that of the front hoof. The position of the bones of the fore leg, under normal conditions, must form a straight line through its entire length.

The bones of a well-formed hind leg, looked at from behind, show, on the contrary, an angular course interrupted by the joints. The thigh bone takes in its course downward and forward, an outward direction, so that the stifle joint falls sideways and outward of the perpendicular from the hip joint, and the horse appears broader in the stifle than in the hip. From the stifle joint, the leg bone runs in an oblique direction downward and inward, and connects through the hock joint with the shank bone. This latter stands again perpendicular, and,

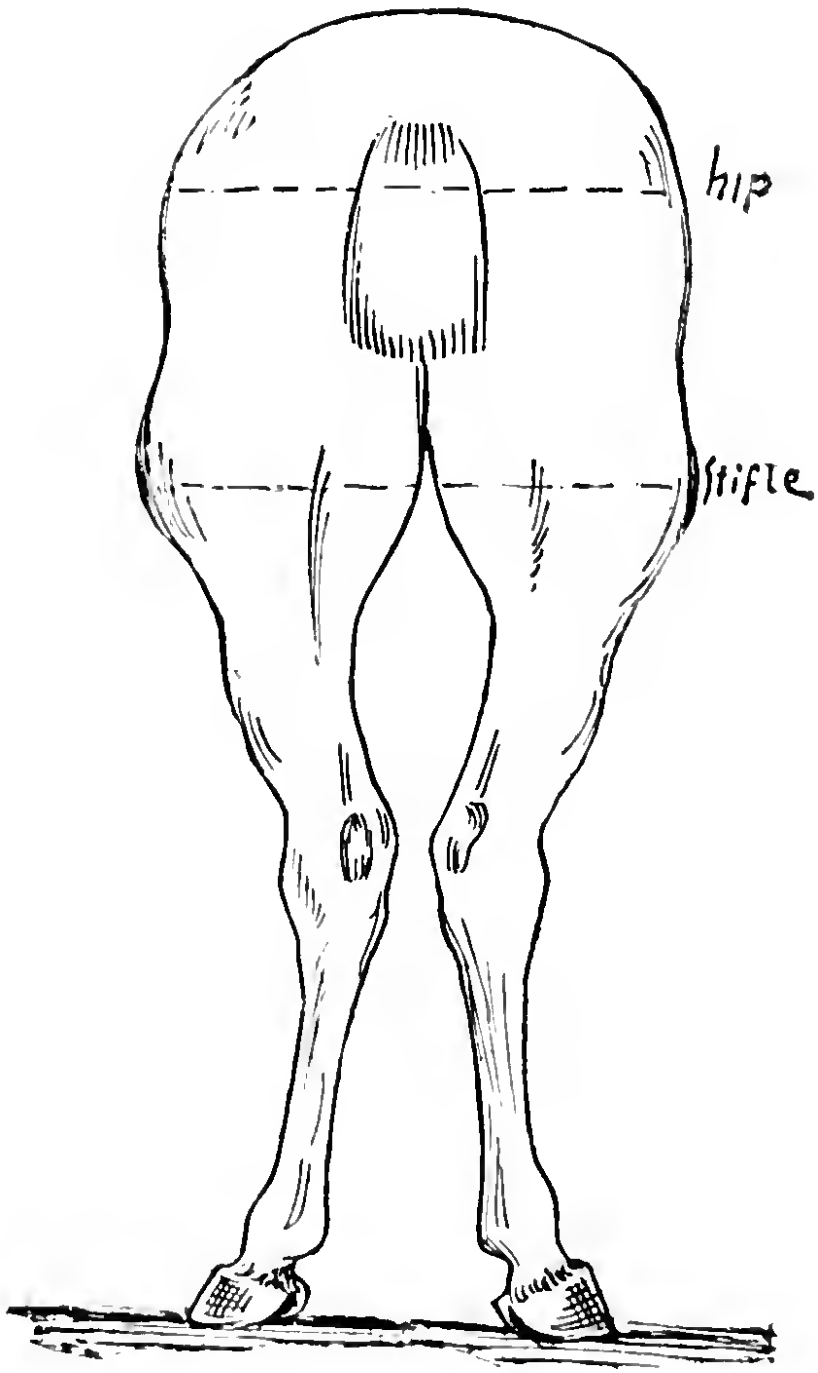
connecting with it, the pasterns. It is apparent that such combination of the bones is advantageous for the extending ability of the limb, as well as for the development of powerful muscles.

In the *hind legs* we find the following deviations from these rules:

(1) The points of the hock joint are placed narrowly together, and from here the shanks run down in an oblique and outward direction, so that the hock, as also the pastern (fetlock) joints, are not perpendicular over the basis of the hoof. The cause for this position is generally a turn of the whole leg around its longitudinal axis, the toe of the hoof being turned outward. The angle of the hock joint is, in this case, generally narrow, and the formation of the leg is called *cow-legged*. As a consequence of the great extending ability of the bones, we observe in this formation, generally, a very roomy stride, though accompanied by an unsightly mowing motion of the leg. The motive power is likewise not sufficient, and, if the blemish is very pronounced, the hock joints are exposed to sprains of the ligaments.

(2) The hind hoofs stand closer together than the hock joints—the so-called *bow-legged* position. The toes are mostly turned inward, undergoing at every step of the leg, a still greater turn inward, at the

FIG. 10a.



same time throwing the hock joints outward. This formation indicates weakness of the limb, is very unsightly and unsafe, and the horse will interfer considerably.

At the *fore legs*, we notice the following deviations from the perdendicular.

(1) The hoofs are farther apart than the upper portions of the leg. The deviation, from the perpendicular, may begin at the elbow joint, or, lower down, at the knee or the fetlock joint. If, at the same time, a turn of the whole leg, around its axis, is connected with the deviations, and the toe of the hoof is turned outward, then it is called the *dancingmaster* position. Horses, with either of these deviations, show an irregular flourishing motion in bringing the leg forward, becoming in many instances the cause of interfering at the fetlock joints, especially if the shoeing is not properly executed. Light-built and narrow-chested blood horses frequently show this position, but without any disadvantages. In this case, the leg must show the deviation from the perpendicular, only from the fetlock joint down, and to a small degree.

(2) The hoofs stand closer together than the width of the chest. If, at the same time, the toe of the hoof, or the whole longitudinal axis of the leg, is turned inward, the danger of striking is greater than

in the former formations, and the disposition to sprains and lameness in the lower joints is augmented.

HINTS TO THE PURCHASER OF A HORSE.

Having examined those qualities of the horse, constituting his propelling powers, let us acquaint ourselves now with some advantages and resources for the judging of the whole framework.

One of the first rules, in judging horses, is to place the horse on level ground. If the horse is placed on an incline, with legs stretched, it appears higher in front, the shoulders appear more oblique, the fore legs, even if already slightly knee-sprung and shaggy, look straight and safe; the back and the croup of the horse appear horizontal, the space between belly and ground gets smaller, and the distance between hind and front hoofs larger. A general comparison of the proportions must be the first step. A perfectly, regularly built horse should not make the impression of being remarkably tall nor remarkably small, else, there are in both cases, certain disproportions. A horse, appearing very tall, is generally long-legged and narrow-chested, while a horse, looking very small, is generally too long-bodied.

The shape and size of the head is in itself very

immaterial, and only of importance for the recognition of the breed, or the character of the animal, but, on the other hand, fancy, or the reigning style, is entirely decisive, viz: considering at times a very small head, at other times a big head and a Roman nose as the prettiest. A big head is certainly not beautiful, but does by no means diminish the usefulness of the horse. If supported by a well set-up neck and powerful neck muscles, it will not fall so heavy upon the hand, as is generally believed.

With the neck it is different; set-up low on a straight shoulder, it will be carried low and flabby, and together with the head will overburden the fore hand. Especially, for the saddle-horse, is the formation and connection of the neck of deciding importance, and many an honest horse has been ruined by ignorant horse-breakers on account of insurmountable difficulties of the neck.

An old custom, to draw conclusions on the qualities of a horse from the sharpness and firmness of the crest, may be mentioned here. The thickness of the fat layer, on which the sharpness of the crest principally depends, justifies a conclusion on the more or less firm texture of the other formations of the body. Firm textures is the inheritance of the nobler breeds. They also possess the dry, firm crest, the thin skin exhibiting the veins and

stretching itself tight over the extremities, and the thin, soft hair of the mane and tail. Spongy and flabby forms, and an exuberant and heavy growth of hair are signs of the common breeds. which horse dealers try to cover defects by shearling the fetlocks and throat, by pulling the mane and tail, by clipping, etc.

Another custom, having also some justification, is that of lifting the tail. An energetic horse dislikes all experimenting about his body, and, therefore, a strong resistance from the horse against the lifting of his tail may be conclusive of the power of the back.

For the judging of the chief proportions we will be materially assisted by some lines. (See Fig. 14, Skeleton of the Horse.)

(1) Draw a horizontal line through the withers over the highest point of the croup;

(2) A line from the upper part of the elbow to the lower part of the stifle;

(3) Drop a line from the shoulder point to the ground, and extend the same upward to line 1;

(4) Drop a line from the point of the ischium bone and extend upward to line 1.

Line 1 serves to judge whether fore and hind hand are equal in height; line 3 shows whether the fore legs, and line 4 shows whether the hind legs are correctly placed under the body.

Lines 1, 3, 4 and the ground form a square, divided by line 2 in two almost equally high rectangles. The upper, somewhat smaller one, containing the rump, the lower one the extremities.

The depth of the rump, from the spinal column to the breastbone, decides the dimensions of the chest. This depth corresponds with the arch of the human chest, and, like that arch, being far more important for the free expansion of the lungs, than the width from shoulder to shoulder, so also has the depth of the chest of the horse more influence on the expansibility of the lungs, than the width of the chest looked at from the front. For the saddle-horse, in particular, does great depth of the chest warrant a good position for the saddle. The height of the upper rectangle finally decides the longitudinal proportions of shoulder and armbone, haunch and thigh bone, recognized so very important for free actions.

The lower rectangle decides the relation of the length of the legs to their distance from each other. We have seen how important it is that the legs should cover much ground in motion. To accomplish this, they need sufficient room, and, they can only find this, if the length of the rectangle is nearly twice that of its height. The more this figure resembles a square, the less will the animal be enabled

to place its hind legs under the body, or to hold out long backward with its fore legs, without the legs being in the way of each other. Horses, of this build, are called long-legged, and, are neither fast nor enduring.

To judge the obliqueness and horizontal extension of the croup and shoulder, and their relation to each other, especially to the back, we drop:

5, a line from the posterior edge of the shoulder and

6, a line from the hip to the ground.

That divides line 1 in three parts. The first part shows the length of the shoulder, the middle part that of the back, and the third part that of the group. The first and third part can never be too long, and the second part never be too short. By good proportions, these three parts in their succession, from front to rear, will be in the ratio of 7, 8, 9. The space between fore and hind legs cannot be too large, and the horse cannot be too long, providing the positions of the legs are correct, and the length of the horse is not brought about by a long back, but by the length of the shoulderpiece and that of the croup. "Short back and long horse" is the demand.

After having examined the horse from the side, inspect it also from the front and rear, paying atten-

tion to the proportion of its width in the hips and the shoulders, to the perpendicular position of the limbs, and to any deviations mentioned before. After this examination has been satisfactory, then examine the horse also *in motion*. Whips must disappear, exciting calls and noise must cease, and the man leading the horse be warned from jerking the horse under the chin. If we notice, that by such practices, the regularity of the paces, especially that of the trot, is frequently and purposely interrupted, then we have to look out for hidden lamenesses. Light, easy and measured action, are signs of harmonious strength, cannot be valued enough, and should not be sacrificed for the prominent action of one single part. The roominess of the paces is discerned by observing the hind legs, the safety, by the action of the fore legs. The carrying power of the back, and the elasticity of the hock and pastern joints, are better judged under the rider, as, in general, we obtain a far better and correct judgment of the power and elasticity of the muscles and sinews, by mounting the horse ourselves.

While riding the horse, we have an opportunity to examine the condition of its lungs or *the wind* as it is generally called. The wind is subject to many modifications. As it is a point of great importance, in regard to usefulness, any horse, with the

slightest imperfection of his lungs, should be at once rejected. There are several degrees of damaged lungs, viz: *thick wind*, *roaring*, *wheezing* and *whistling*, all of which degenerate finally into *broken wind* and arise from disease or obstruction of some of the air passages of the lungs, the windpipe, bronchial tubes or nostrils. Such diseased horses cannot be cured, on the contrary they grow worse day by day, even by moderate work, until the horse is totally wind-broken and useless.

Thick wind arises from insufficient space for the expansion of the lungs, or, for the expiration of the air through the bronchial tubes, owing to the thickening of the mucous lining in consequence of former inflammation. It is detected by the laborious breathing which often extends almost to suffocation and generally ends in broken wind.

Roaring is a minor degree of thick wind, originating from thickening of a portion of the mucous membrane within the windpipe, producing a contraction of the same, thereby preventing the free expiration of the breath. It is detected by the exertion which causes the horse to expel the air producing a loud puffing or roaring sound—the inspiration is noisless. It shows itself during excitement or sudden motion.

Wheezing is a modification of roaring, differ-

ing from the latter, in that it can be noticed even if the animal is completely at rest and in the stable, it originates from the lodgment of mucous matter in the bronchical tubes.

Whistling is also a modification of roaring and differs from the same in that it does not appear after excitement or sudden motion, only after lasting motion, and the noise it produces is more shrill. It originates from contraction of the larynx.

Broken Wind originates from rupture of some of the aircells of the lungs, the inspiration being effected readily by a single effort as usual, but the expiration requiring a double, and in very bad cases, even several efforts to expel the breath. When the horse is at work, this disease cannot be mistaken. A loud sobbing breath and the laborious heaving and jerking collapse of the flanks indicate this defect. It is accompanied by a hard and husky cough. This disease can never be cured.

Horses, having any of these diseases become speedily exhausted by work and are absolutely unsound. There are various ways to detect these defects. The usual way is to grasp the horse's throat from the front near the mouth of the larynx, compress the same forcibly so as to cause him to cough. A sound horse will cough but once and recover his breath with a clear deep inhalation

and exhalation, while, in a diseased horse, we hear a broken rattling cough, the wind being recovered by a long laborious and wheezing effort. This sign is decisive and the degree of labor will show the more or less advanced degree of the disease.

A roarer can easily be detected in the stable, as well as on the road, by the distressing sound he produces. Step into the stall of a roarer and administer an unexpected sharp blow on the belly. A loud grunt will explain his condition. Under the saddle give him a long sharp gallop, pull him up suddenly and listen while you incline forward and downward, bringing your ear close to the windpipe, or dismount quickly and put your ear close to the neck near the head. You will hear the whistling sound for some seconds and even minutes. In this way you may detect the disease in its smallest and most incipient stage.

The examination of the eyes is most difficult and should better not be undertaken by the purchaser, but by an experienced veterinary surgeon.

A very important—in fact a deciding point—in regard to the usefulness of a saddle or carriage horse, is *the conformation of his jaws*, which should never be neglected in examining a horse. Everything satisfactory, but this part, the horse should be rejected as unfit for the purpose. The jaws

should be *diverging* so as to make room for the throat.

We all wish our horse to look as stylish as possible, the same time we want him to be light in hand. This can only be the case if the horse is able to arch his neck; consequently there must be the necessary space for the throat to slip in between the jaws.

A horse with *parallel* or *converging* jaws, will never be able, in spite of all bitting bridles, to give in his nose, as, in trying to do so, the edges of the jawbones press against the neck, squeezing in the glands and causing the horse intolerable pain. These glands are situated just under and inside of those edges, and, if cramped in, the free circulation of the blood is stopped, and, as they are also in connection with the eyes, such pressure frequently causes a rush of blood to the eyes or to the brain, followed by the horse running away, rearing, plunging, boring on the hand, etc. Many an accident could be traced back to such malformation. Thoroughbreds show this conformation very frequently, but, as in running, they are allowed to stretch their neck, it does not matter.

Adding to this malformation, a tight buckled throatlash, as we almost invariably find with saddle, as well as with carriage horses, it is simply

astonishing that no more accidents happen. It is the utmost cruelty to the poor animal, to force his head by means of the reins into a position, which nature or a tight throatlash renders impossible to assume. Many of those artists, calling themselves saddle-horse trainers are in blissful ignorance of this fact. They kick and jerk the horse in all directions without the coveted result,—that is, securing the nose and thereby the lightness in hand.

In almost every private stable we can see a horse in a boxstall with a bitting rig on, and the poor creature vainly torturing itself, trying to put its neck, under the circumstances, in an impossible position. This speaks volumes of the utter ignorance of many of those in charge of horses. They should tie out the horse, first only lightly on *one* side, buckling the other rein just so much looser for the purpose of keeping the neck straight, thereby giving the horse a chance to flex this side gradually and, then, after fifteen minutes change sides. One hour's exercise at a time is sufficient. Continue this until the glands, which come out strong, disappear gradually under the jaw. In this manner, the horse would, after a time, be able to flex both jaws together; but we generally see both reins tied as short as possible from beginning, no matter what agonies the horse suffers. If, under

this pain, the horse gets restless, rears up and throws himself over, these individuals are utterly astonished and even quite indignant at the viciousness of that beast, and many are the blows he receives in the bargain. As long as horse-owners do not take more interest in their horses it is to be feared that such contemptible practices will not be stopped.

The best way is, never to buy, for saddle or harness use, a horse whose jaws are not *diverging*.

A few words about the "*flying step*," formerly so much favored. If, at a sharp trot, the fore leg is extended fully, the hoof pauses for a moment entirely, floating in the air, as it were, so that, observed from front, the sole of the hoof can be seen. The pausing of the hoof marks the moment when the propelling power of the hind leg comes to a premature end, being no longer able to throw the body to that place, where the hoof points. It forces the animal instead of carrying out the step to its full length, to draw the leg back. The flying step is, therefore, a useless waste of power, affecting muscles and sinews in a high degree. Experience shows that these horses cover very little ground.

Just as ruinous is the "*high knee action*," so much in favor at present, and almost the sole consideration for the valuation of a carriage-horse. It is the

same useless waste of power, affecting, not only muscles and sinews, but also attacking the joints considerably. Such horses also cover very little ground. The high knee action originates from too great length of the cannonbone in comparison to the length of the fore arm, and has nothing in common with the really beautiful high step-out of the shoulder, which, being supported by an energetic motive power of the hindquarters, will do its best for the safety and roominess of the action.

Finally, we have to view the movements from front and from behind and to observe, whether the legs cover each other and are brought forward in a straight direction.

The examination of the hoof is of the utmost importance, but it is beyond the limit of this little treatise to go into details. Be it said only that it is the more important to look for a sound hoof, if the horse is to be used on hard pavement. A brittle, a flat or a contracted hoof, in this case, disqualifies an otherwise good and serviceable horse.

It is likewise impossible to discuss the numerous blemishes on the joints, bones, etc. If in consequence of irregularities in the structure, defects on the limbs have made their appearance, and in such places, which apparently in consequence

of those irregularities, have to sustain increased strain and are therefore most exposed to ruin, then there is a disposition to that defect. In this case, we may call it a *necessary defect*. On the other side, blemishes not resulting from the structure, but brought about by casual injury, by overburdening or false distribution of the weight on the part of the rider, we may designate as *casual defects*.

If a horse, whose weak fore legs succumbed under the throng of a superior hindhand, shows enlargement of the tendons, galls, or crooked knees, then such blemishes will be necessary ones. If we find the same blemishes on a favorably built forehand, and which is perhaps superior to the hindhand, we may consider them as the results of casual events or brought about by a bad rider. They may not reappear in future. We see how differently we have to judge the same blemish on two different horses, how erroneous it is to regard every defect as serious and to insist on buying only a horse free of any blemish.

The greatest skill, in judging horses, consists in letting pass a blemish at the right time. Never scruple about casual defects, not rendering the animal unserviceable, but take good care never to buy a horse affected with a necessary defect, even if ever so little developed. Examine carefully the

weak parts for thickening of the skin, white hairs or a scar, indicating *blistering* or the *hot iron*. Finding the least thing, the proof is established that the respective part has succumbed under the exertion, and that the next exertion will result in the reappearance of the cured blemish.

The great advantage to the dealer, in selling green and young horses, is that work has not marked as yet the defective and weak parts with blemishes on the bones.

When the number of connoisseurs has so much increased that a four-year-old, clean-legged horse of faulty structure, would bring a far inferior price than an eight-year-old of good formation, even if affected with some casual blemishes, (a natural result of work;) only then, when the breeder would find it impossible to dispose of those worthless creatures which are ruined after a two years use, and, if this sort would *no* longer pay the cost of rearing them, then such mares would no longer be used for breeding purposes, which being cripples themselves can bear nothing but cripples, and no stallions would be employed whose faulty and common structure must spoil the following generations.

DESCRIPTION OF THE MOST COMMON BLEMISHES ON THE LEGS.

BLEMISHES ON THE FORE LEGS. Fig. 11.

Splints (*a*) are bony tumors found on the inner splintbone, running down on the inner side of the cannonbone and are occasioned by violent blows or other injuries, sometimes causing lameness, if so close to the knee as to interfere with the action of that joint, or, so far back as to touch the back sinews. If located on the middle of the bone they are of no consequence. They will generally yield to blistering or puncturing. The tendency to splint is greatly increased by the practice of some blacksmiths of raising the outer heel of the shoe considerably, thereby throwing the weight of the horse more on the inner splintbone.

Tied in below the knee (*b*) is a serious defect, interfering with endurance and speed. Such horses are not fit for fast or long work as the result would be a serious sprain of the back sinews. The leg is insufficient in depth right under the knee.

Sprain of the Back Sinews (*c*) is an inflammation of the sheath of the back sinews, the result of wrench

or sprain, overwork or sudden and violent exertions. If the inflammation is very great, the horse suffers considerable pain and will be very lame. Back sinews, that have once yielded, can never again be depended upon. They are a serious defect and a sufficient obstacle against buying.

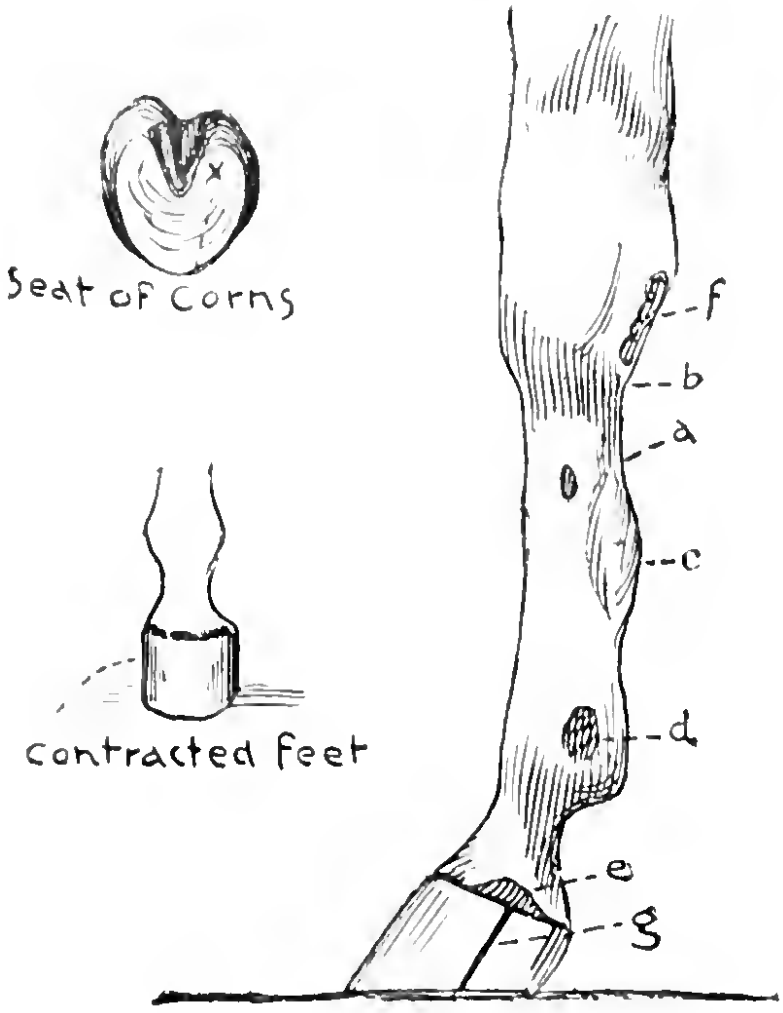


FIG. 11.

Windgalls (*d*) occur on both fore and hind legs and are puffy enlargements near the fetlock, caused

by continued hard work, especially under the saddle, or by violent actions and straining of the sinews. They are not serious defects as they seldom produce lameness.

Sidebones (*e*) are bony tumors on both sides of the lower pastern bone, just above the hoof, producing lameness, and are incurable. They are easily detected by passing the hand carefully over the part. They generally spread rapidly around the foot, forming a complete ring, and are then called *ringbones*. They cause serious lameness and are signs of positive unsoundness.

Mallenders (*f*) are scurfy eruptions in the bent of the knees. A discharge proceeds from them which must be taken care of at the start, as it is afterward very difficult to stop. They seldom produce lameness, but indicate bad stable management.

Quarter crack (*g*) is a separation of the hornwall of the hoof from the coronet down to the sole and occurs on the inner side of the front hoof only. It is produced sometimes by violent actions on hard roads, especially if the nails are driven too tight, or the shoe is left too long on the hoof, in both cases preventing the expansion of the hoof. A burst of the wall must occur on the top of the hoof, or, it may occur in hot weather when the hoof becomes dry and hard and stopping the feet is neglected,

which ought to be done twice or three times every week, but should be carefully removed before the horse goes to work, or, if the horn is naturally brittle. If the crack is only partial, it generally produces no lameness, but, if it extends all the way down to the sole, the case becomes serious. It takes a long time to grow down again, and the animal should not be used on hard ground. The horse should be shod in such a way that the injured part does not rest on the shoe so as to prevent pressure.

Corns are found on the sole of the front hoofs, in the inner angle formed by the crust of the hoof and the bar, and are caused by contracted feet, or by pressure of the shoe, or by gravel lodged under the shoe. They are signs of neglect either from not removing the gravel or stone as soon as the horse returns to the stable, or from bad shoeing. They produce sometimes considerable lameness. Such horses are unsafe and should be rejected.

Flat Hoofs. The sole, instead of forming an arch upward, as in a sound hoof, is perfectly level with the ground. If the sole is strong, the horse may perform his work well enough on smooth ground, but, on uneven, stony roads, they suffer great pain and are absolutely unsafe. They frequently degenerate into *full hoof.* The sole descends below the

walls of the hoof. Such horses are unfit for any work, as the sole becomes very thin, causing the animal great pain at step. Such poor sufferers ought to be shot for mercy's sake.

Contracted Foot. While the sole of the sound front hoof has a somewhat round shape, the contracted hoof has shrunken, presenting an irregular oval shape narrowed in at the heels, the inner wall of the hoof looking as if crushed in. It is produced by inflammation, arising from various causes, but, in most cases, by bad shoeing. The frog becomes narrow and hard and has an unhealthy appearance. Contracted feet produce corns and frequently considerable lameness.

BLEMISHES ON THE HIND LEGS.

Fig. 12.

Thorough pin (*a*) is an escape of the synovial fluid in the form of a swelling between the bones of the hock joint, above or below the hock, running across, and in front of the joint from side to side, but is seldom attended by lameness. It resembles *bog* and *bloodspavin* (*e*), which are located at the lower and anterior part of the hock joint. They are frequently found together, seldom causing lameness, but chiefly weakness and stiffness of the hock joint. The horse is able to perform ordinary work, but is unfit for hard and fast work, as the joint itself is affected.

Capped Hock (*b*) is a swelling of the point of the hock in the form of a soft fluctuant tumor, and is produced through bruises by blows, or kicking in harness, or in the stall, or, by lying on a thin bed or on the bare floor. It is seldom accompanied by lameness, is very unsightly though easily removed.

Curb (*d*) is an enlargement at the posterior side of the hock, about four fingers below its point, and is produced by sudden and violent action of the limb. For instance, after an extraordinary leap, a sharp gallop over heavy ground, or a severe and sud-

den check from a gallop, cow-hocked horses are particularly liable to it. After their first appearance, they generally produce considerable lameness.

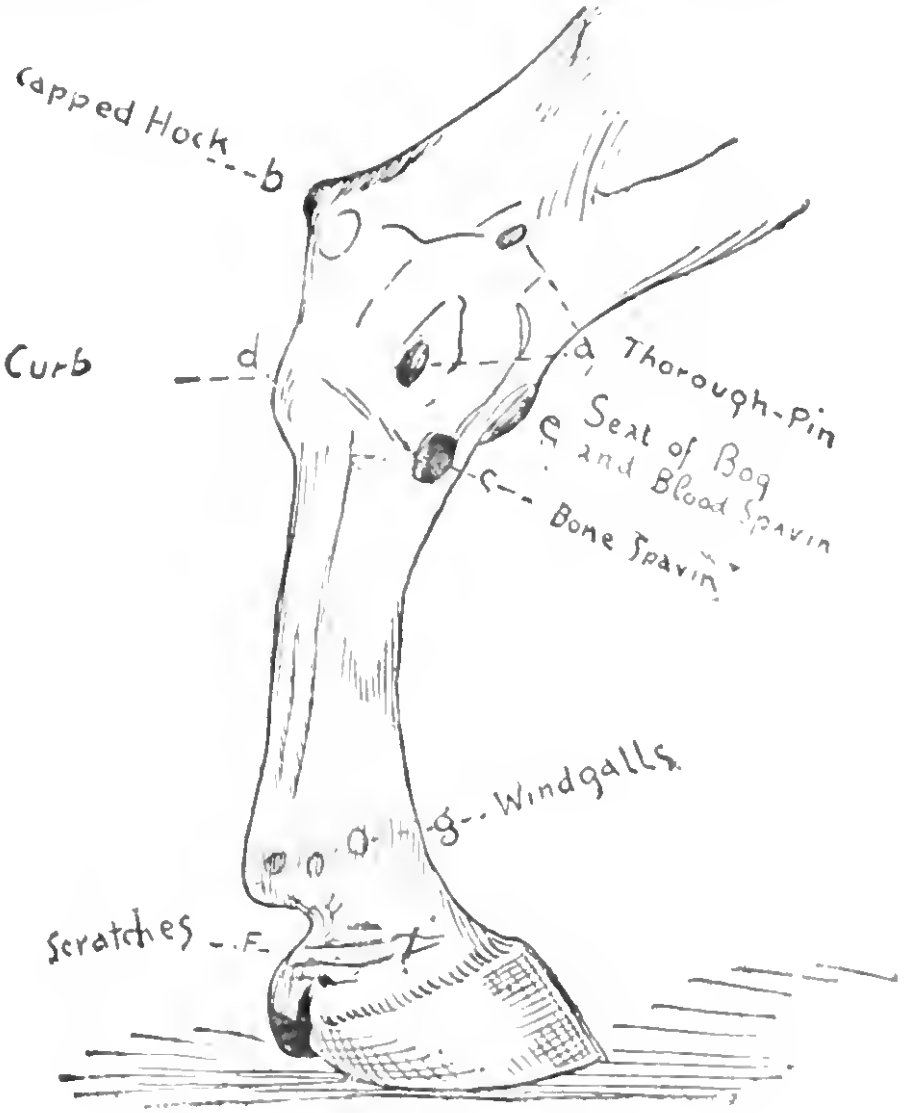


FIG. 12.

Cow-hocked means, if the hocks stand narrower together than the hoofs, the lower legs and the toes are turned outward. A slight inclination to this

shape, in an otherwise powerfully built horse, is not objectionable; but, in a horse decidedly cow-hocked, the weight is thrown too much on the inside of the hock, producing curb, spavin, and enlargement of the hock, generally attended by great lameness.

Bone-spavin (c) is a bony tumor on the lower and anterior inner part of the hockjoint, and is discernible by looking, from front, backward. It may produce total lameness, or only a severe lameness, at first starting, which may in time subside or disappear, according to the degree in which the bony excrescence interferes with the motion of the joint. Many a spavined hunter stands his work without lameness. Other horses, again, merely show a stiffness at first starting, which disappears as soon as the horse gets warmed up, while others, with, perhaps, a very small bony tumor, are so desperately lame as to destroy their usefulness. Spavined horses are not fit for fast or regular work, as this lameness, producing great pain in rising, prevents many horses from lying down; and a horse that cannot rest, cannot work. Blacksmiths frequently increase the tendency to spavin by raising the outer heel higher than the inner, with the object of preventing interference.

Sallenders are a similar eruption as *Mallenders*, and are located at the anterior bend of the hock or a little below it.

Scratches first appear as a dry and scaly state of the skin of the heels, combined with redness, heat and itching, and should be attended to as soon as they make their appearance, because, if neglected, the heels begin to swell and crack open, emitting a thin glairy and very offensive discharge. They are a sign of bad stable management, through leaving the feet and heels wet after work on muddy roads and exposed to a cold draft. Sometimes they are caused by impure blood after sickness.

THE AGE OF THE HORSE.

Fig. 13.

To cover *every case*, it is almost impossible to put down invariable rules for telling the age of a horse. There are exceptions, as for instance: *a crib-biter* will wear his teeth off faster than by the natural course, which is about $\frac{1}{10}$ to $\frac{1}{12}$ of an inch per year; or of a *thorough-bred* horse, the strong structure generally makes the teeth also stronger than those of a horse of a common breed of the same age, causing the horse to appear younger than he actually is.

Horses change their first set of teeth, called the *milk teeth*, between the second and fifth year, for the second set, called the *permanent* teeth. During the first period of its life, up to five years old, the animal is called a *colt*. The second period comprises the time from five years upward, when the animal has its permanent set of teeth. From this age it is called a *horse*.

The milk teeth are different in shape from the permanent teeth, showing a well set-off body and neck, and, on their front surfaces, *grooves* which disappear from the centre nippers at the age of one

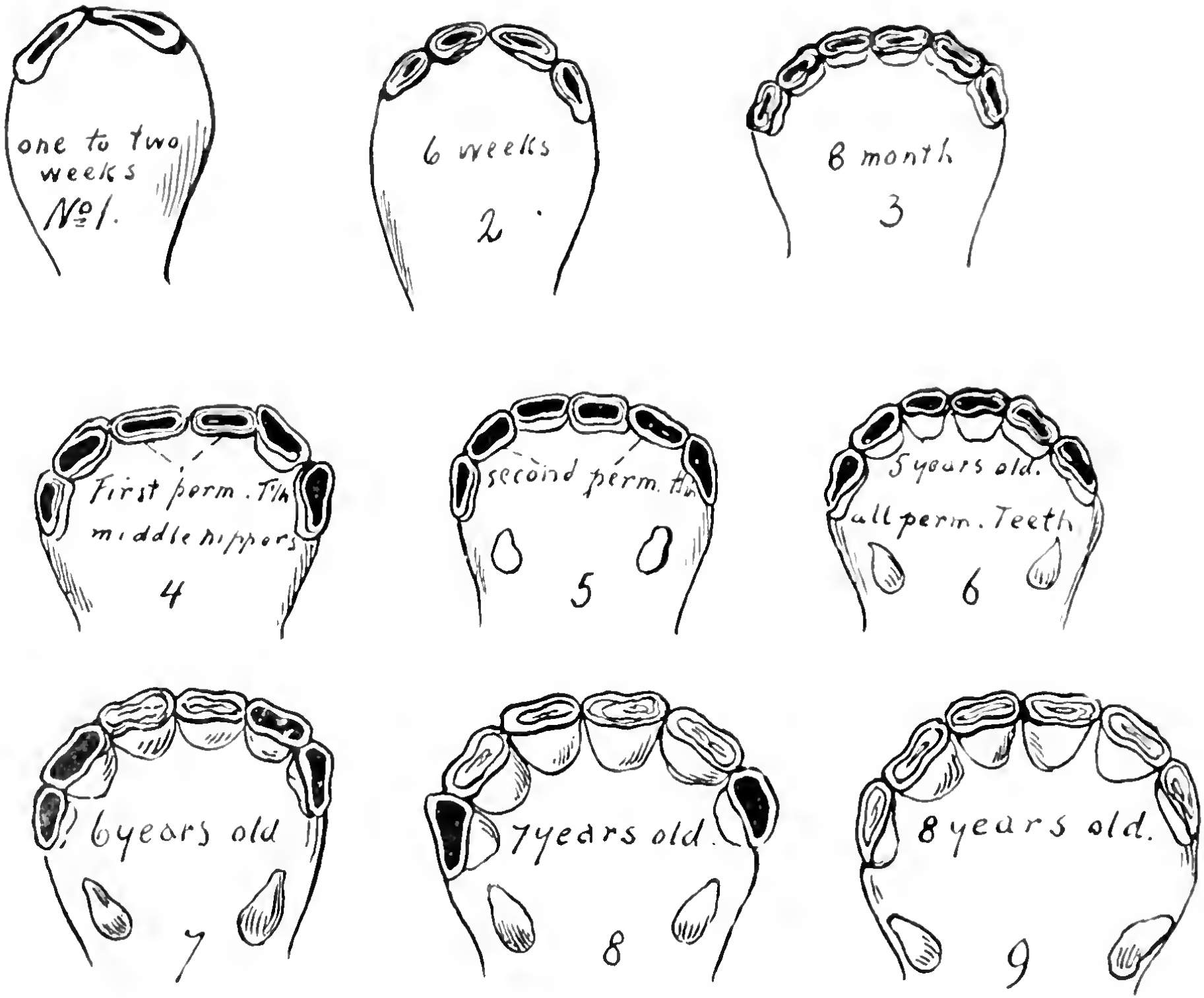


Fig. 13. Teeth of the Horse

year, from the next pair at the age of two years, and from the corner nippers at the age of three years. The milk-teeth are replaced by the permanent teeth in the following order:

(1) One to two weeks after birth the first two teeth (centre nippers) of the set of milk teeth appear in lower and upper jaw, (Fig. 13-1) which, at the age of two years, become loose and fall out, and in their places appear permanent teeth (No. 4) with deep cavities or *marks* and sharp edges.

(2) About six weeks after birth, appear the next pair of milk teeth in both jaws, (No. 2), which fall out with three years old, and permanent teeth grow up in their place, No. 5).

(3) About eight months old, the last milk teeth, the *corner nippers* appear, (No. 3) which fall out at the age of four years, and the last permanent teeth make their appearance, (No. 6) so that with five years old, the teeth are all in line and *the horse has his permanent set of teeth.*

The teeth grow every year from $\frac{1}{10}$ to $\frac{1}{12}$ of an inch, but are worn away at the same ratio by use, so that with—

Six years old the black cavities or marks have disappeared from the centre nippers. (Fig. 7).

Seven years old the black cavities or marks have disappeared from the next pair. (Fig. 8).

Eight years old the black cavities or marks have disappeared from the corner teeth. (Fig. 9).

With eight years the upper and lower corner teeth just meet.

At nine years old the marks disappear from the upper centre nippers, and also each of the upper corner teeth shows a sharp protrusion at the extreme outer corner.

At ten years old the marks disappear from the next pair of the upper jaw.

At eleven years old the marks disappear from the corner teeth of the upper jaw.

The teeth, which up to this age have an oval shape, become broader and rounder, and change, between the 12th and 16th year, to a *triangular* shape. From the 16th year, they lose all regular shape, and the age can only be guessed.

The tushes or tusks in male horses are cut between the 3d and 4th year of age, are conical in shape, somewhat curved and sharp pointed, but are worn down, with the advancing age of the horse, to a more and more rounded form, and finally lose all regular shape.

Mares generally have no tusks at all, or only faintly visible tushes.

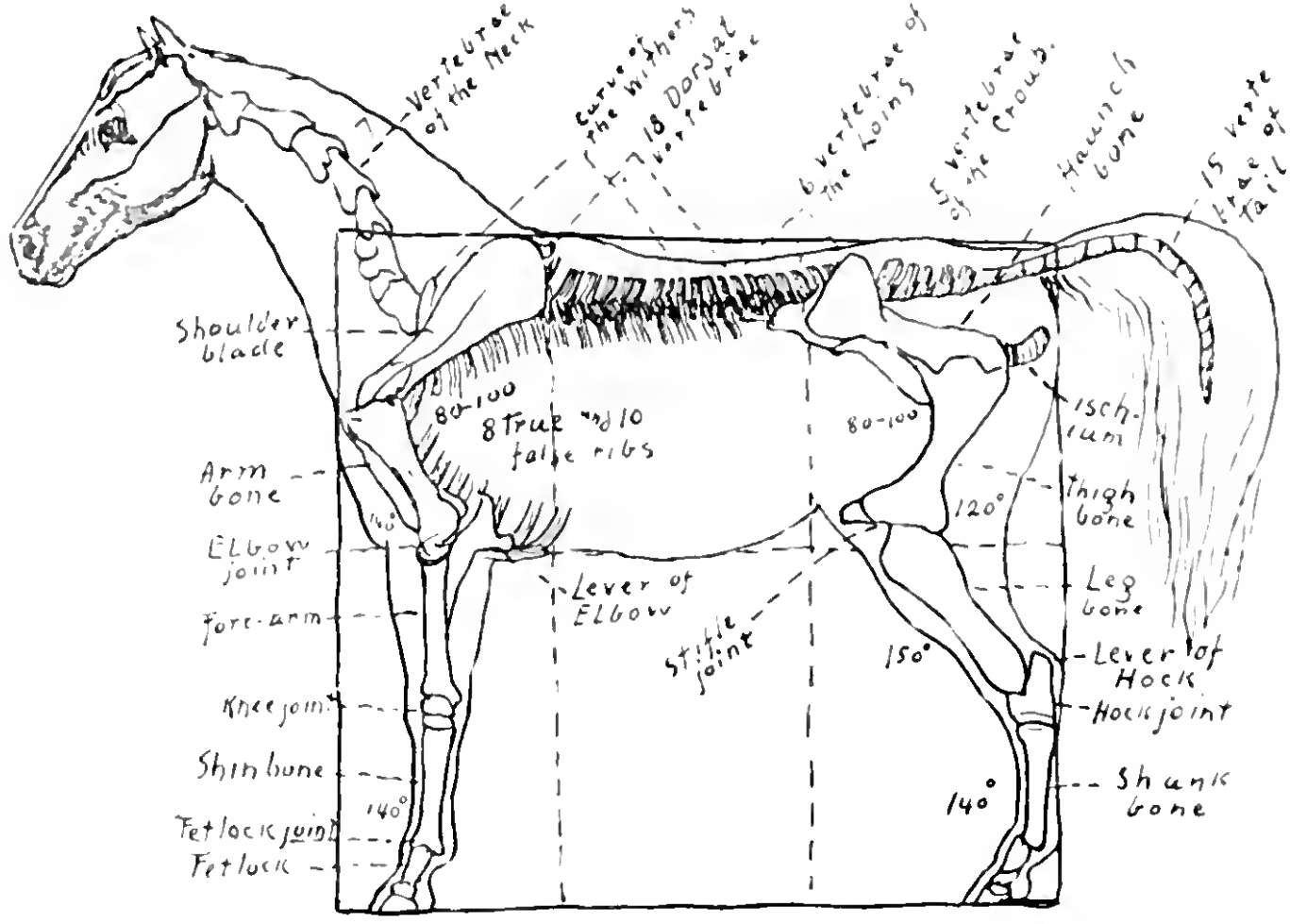


Fig. 14.—Skeleton of the Horse

RAREY'S AND ROCKWELL'S METHODS OF TRAINING YOUNG AND OBSTINATE HORSES.

(1) INTRODUCTION.

Rarey's and Rockwell's methods, being decidedly superior to other methods, are based on an exact knowledge of the individuality and the peculiar nature of the horse. Therefore, and because they are the result of many experiments, and because of a close scrutiny of the different methods heretofore in use, they deserve to be pronounced the best.

Before proceeding any further, it will be necessary to make the reader aware of a wide-spread mistake in the taming of wild and vicious horses, viz:

(2) FALSE VIEWS OF THE HABIT OF HORSES TO SMELL AT UNACCUSTOMED OBJECTS.

There exists a prevalent opinion amongst horsemen, that the scent is the leading sense of the horse. Based on this opinion, Boucher and other horse-tamers, have recommended that strong smelling oils and other substances be blown into horses' nostrils for the purpose of training them. Other ways are, to blow in the breath, or to moisten the hand with the perspiration from under the arm and to hold it

under the horse's nose. All these means have, so far as the scent is concerned, no effect whatever upon the taming of the horse or the possibility of making it do a certain thing.

Rarey, whose opinion we consider decisive, because consonant with nature, says:

"As the horse has a habit of touching with its nose everything new to him, one might believe that it smells at it, but, I believe, that the horse uses its nose as we use our hands, for the purpose of *touching* the object, because the nose is the only organ, that enables it, to touch with an acute feeling, any object. I believe, that the horse uses the four senses: seeing, hearing, smelling and feeling—the sense of feeling being, perhaps, the most important—in all his examinations, and, that the slow approach of the horse, and the final touching of the object with the nose, is frequently done for feeling's sake—the sense of smelling being so well developed as not to necessitate the touching with the nose, to find out the peculiar smell of an object."

As we cannot give any reason then, why a horse should comprehend, by the sense of smelling, what we want of him, therefore, the use of strong smells is useless for the training of the untamed horse. Only by words and sounds are we able to influence it, to submit to our demands, of its own free will

without using force. Through the smells alone, we can never teach a horse anything; the actions alone, accompanying such means, as: touching, caressing, speaking, must bring about the desired result, erroneously ascribed to such narcotics. The habit of the horse to touch objects is simply an emanation of its peculiar instinct to examine everything.

Rarey's method is applicable, not only to horses afraid of man, but also, to such that are vicious and obstinate, and therefore, being more in need of training than wild horses.

Rarey, who claims to have tamed horses oftentimes at less than one hour's time, bases his success on his skill to inspire the animal with *fear, love and obedience.*

(3) FUNDAMENTAL RULES OF RAREY'S THEORY.

First Principle: The horse is naturally obedient and offers no resistance to any demand, if put to him in a manner appropriate to his nature and comprehension.

This principle is based upon the fact, that the horse, though possessed of a strength far superior to that of man, is docile, because it has neither reason nor power of judging, therefore, no conception of right or wrong, or of acts based on a free will. If it had the faculty of reasoning, it would come to

conclusions, making it entirely unfit for the service of man.

Second Principle: The horse has no perception of its own strength, therefore it is submissive without opposition to our will, as can be seen daily.

Third Principle: As the horse, according to its nature, examines everything new to him, it will permit to be placed, before, over, or on it, any object ever so frightful, without creating any fear, provided it causes him no pain.

A white stone, the stem of a tree on the road-side, looks strange and suspicious, and he refuses to pass by. If we guide him up to the object, permitting him to stop a minute and examine the same with his nose, the terror will pass away and he will become reconciled. Examples are military horses, which are not afraid of the noise of arms, drum, music, or even firing.

The above mentioned principles, based on a natural perception of the individuality of the horse, may look insufficient and inappropriate only to those who shut their eyes to nature which governs the instinct of animals. Such persons strive in vain to reach by circuitous ways, what they could accomplish by careful observation of the peculiarities of all creatures and by taking advantage of their weaknesses. Wherein consists the superiority of

man over the beasts, and what are the means to subjugate powerful animals? Neither the dexterity of man nor his strength, nor the power of his eye, would alone be sufficient to subdue them, if besides these agents, there were no other means at his disposition. But these means are not the fire-arms, the chain or the cage. They are of a spiritual nature, founded on the ability to penetrate into the character, into the whole nature of the animals and their wants, to find out their inclinations and to gain their love. But, this latter must be coupled with fear. It is undeniable, that by kind treatment, speaking, and dainties, we are able to pacify the liveliest horse for a time, but, on the other hand, there are also moments when only whip and spur can subdue a refractory horse and make him feel the superiority of man—means which, of course, should only be employed as a last resort. If not applied at the proper moment, or in a well measured degree, they will render the horse obstinate and, under circumstances, entirely unserviceable.

As none of all the secret means, recommended in books for the taming of horses, is in correspondence with their nature and not lastingly effective, there is no other way to educate the horse, according to his nature, than that guided by the above principles, in

connection with the manipulations described further on.

In the simpleness of the system, based on the most rational principles, rests the guarantee for the practical execution and the success. Under all circumstances, in handling a horse, preserve your temper, no matter how provoking, for, if you lose control of yourself, you will be sure to lose control of your charge. The horse must be governed by kindness and determination, not by abuse and tyranny.

4.—APPLICATION OF RAREY'S PRINCIPLES FOR WILD AND SHY HORSES.

For the application of the principles laid down in the preceding chapters, Rarey says:

"Provided with a long whip, topped by a silk snap, so as to crack loud, step into the enclosure where the horse is, stand still, allowing it to look at you a few minutes. If it stands still, move up to it slowly, the right arm holding the whip stretched down at your side, while the left, bent in the elbow with the hand stretched forward, is held out toward the horse. In this position approach the horse slowly, but not too directly, toward its head or back, so as to prevent its moving forward or backward; but, in case that should happen, step carefully a

little aside, so as to cause it to stay where it is The nearer you approach, the more move toward its shoulder, and then stand still a few seconds. As soon as you come near enough, the horse will turn its head and smell at the extended hand, not because it has a special liking for that hand, but because that part of its master's body is nearest to it. As soon as that occurs, or the horse is touching any other part of your body, caress it by stroking it in the direction of the hair, in a tender and soft way, moving your hand as light as possible along the neck and the side of the head. Every attempt of the horse to touch you with its nose is to be favored, every touching of your body to be rewarded by tender caresses, kind looks, and gentle words.

In speaking to the horse, always use the same tone of voice, because it learns very soon to distinguish, by the expression of the face and the tone of the voice, what feelings govern its master.

5—RAREY'S METHOD OF TRAINING OBSTINATE HORSES.

In taming wild horses it becomes necessary to gain their lacking confidence, while with horses being only stubborn and restive, turning around and kicking at any attempt to approach them, the necessary respect and fear must be established. There-

fore, it is expedient, so as to facilitate the handling, to give it a few sharp cuts with the whip around the legs close up to the body. The cut, applied there, has more effect than two or three cuts over the back, the skin on the inside of the leg being thinner and more sensitive than on the back. If punishment becomes necessary, for the purpose of inspiring the horse with fear and of breaking his obstinacy, not for the purpose of inflicting pain, we must take care not to administer only one cut, as that would only produce anger instead of fear, thereby increasing the vice. As soon as the horse shows fear enough, causing him to stand still and to pay attention to you, approach him again and flatter him more than you before whipped him, thereby awakening in him the two chief factors to his submission: *fear* and *love*, and he will willingly do what you demand of him.

6—THE HANDLING OF UNTRAINED HORSES.

Before making the reader acquainted with the special rules and manipulations, necessary for the handling of untrained horses, it is important to impress upon him the following rules, experience proving that success can only be attained by adhering to them.

To remove the terrors, of which the horse is possessed by coming in contact with man, and to create love and confidence to the latter, it

becomes imperative to converse with the animal during the exercises, by speaking, coaxing, etc., and by increasing these caresses, if the horse permits. It is absolutely necessary, at first, to be alone with him, in some enclosed space, taking care that no object of any kind diverts his attention from his master, or frightens him or makes him shy. Every attempt of the horse, to touch you with his nose, or to smell at you, is to be humored, and great care must be taken, not to change the tone of the voice or the expression of the face, at moments of displeasure, the horse understanding quite well, whether anger or love for him govern you, the former alarming and estranging him from you.

Never be hasty in the exercises and never proceed to anything new, before the horse has perfectly understood the present lesson, and he fully understands those exercises and full confidence is established between him and his master. Never tire the horse out, never ride him warm. As soon as you notice one or the other, caress him and give him rest. By such proceedings, you can avert the horse from getting vicious and obstinate, and render him a very willing and intelligent pupil.

7—PUTTING THE HALTER ON THE COLT.

Place yourself on the left side of the colt, near the shoulder, put both arms around its neck, and hold

the head of the animal toward you. Taking into your right hand, first, only that part going over its head, slip the halter, with your left hand, gently over the nose of the colt, taking care that he does not start back, if the hand is placed over the same. As soon as the halter is put on, fasten to it a long strap or rope, and make the colt walk around the enclosure, without pulling at him. As soon as he feels the hand on the halter, having full play on the line to stride forward, he will never pull, tug, rear, nor throw himself down, which he would be sure to do, if held by force at one place. The animal, not aware of his strength, does not know that he could easily break the halter, and he will never make use of his strength, if not provoked by tugging and jerking.

If the colt submits to being held by a short line, and, without shying, permits you to approach, proceed to make him tractable. For this purpose, do not step in front of the animal, trying to pull it after you, but try to guide it to one side. It will follow a gradual pull on the halter to that side, not being able to offer much resistance with its neck. As soon as it has made a few steps sideward, caress and repeat the manœuvre, until you can guide it in any direction.

By repeated practising, and by the increasing love to its master, gained through gentle intercourse, it

will soon understand that it has to follow him, and that the more so, as it does not know, that on account of its strength, it need not follow. Before leading the horse out of the enclosure, lead it first around for a little while and then, opening the door, lead it past the same a few times, finally guiding it slowly through the door, by taking hold of the halter with your left hand close to the mouth, while the right hand, resting on the neck, grasps the mane. After a short time, you may gently guide it, as you please. It will always willingly come up to you. Care must be taken, that no objects are near that may cause it to shy, and that no other person be present, to divert its attention.

8—To train the colt to go at the side of a trained horse.

For this purpose, take a trained horse into the stable, and put the colt at his right side. Fasten a second strap to the halter of the young horse, pull that across the breast of the old horse, which should be mounted first, and take the end into your left hand. If you then take the other strap into your hand, the latter strap will prevent the stepping too far forward, the former, the hanging back. In this manner, guide the horses around in the stable a few times and then go out of doors. In case of the

stable door being too narrow for both horses to pass through, at the same time, guide the old horse out first, turn it around so as to face the door, then, bring the colt near the door, take hold of the straps as described before, let somebody urge the colt out gently, turn the old horse to the left and everything is again in good order. The above straps are sufficient to keep the head of the young horse turned toward the old one, so as to control it. Should it become obstinate, refusing to go on, turn the old horse toward the right, that is, against the neck of the colt, compelling it to turn a few times, when it will be willing to stride forward again.

After having taught the young horse to be guided, take it back to the stable and tie it so that it cannot tug on the halter. If the young horse refuses to follow the old one, which has been taken in the stable first, take hold of the halter with your left hand near the head, place your right hand, armed with a whip, over the back of the colt, direct its head toward the stable door and administer a light cut with the whip as far back as possible. The cut coming from behind and from the other side, the colt will move forward and to that side where his master is. All the master has then to do, is to give, with his left hand, the proper direction, and it will go into the stable without further trouble.

Should it not be possible in this way to get the colt into the stable, lead it around in all directions, stopping occasionally at the door, and it will not take ten minutes before it will enter. Never try to pull a young horse into the stable by force, as it would learn to regard the stable as a dangerous place.

9—TO TIE THE YOUNG HORSE, WITHOUT ITS PULLING AT THE HALTER.

The young horse should be fastened in a stall, rather wide, but not too long, so that, on account of a movable crossbeam, fastened at a short distance behind the colt, it is not able to step back enough to tug at the halter in a straight direction backward. If the animal is then tied in the middle of the stall, the halter will prevent its turning far to the right or left, and, compelled to stand quiet, it will, even if tied by a light strap, never try to break it.

Rockwell's method to cure horses from pulling at the halter, is first, to place a common halter on him; then put on a common girth. Take a half-inch rope, about twenty feet long, pass the centre of this rope under the tail in place of a crouper, twist the rope over a couple of times, pass the ends of the rope under the girth, bringing one end up on each side of the neck and pass the ends under the girth and

through the nose-piece of the head stall, under the cheek pieces, and tie to a stout post, leaving about three feet play of rope. As soon as the horse pulls back, he, being tied by the tail to the post, pulls upon his tail, Fig. 15, and the hurt

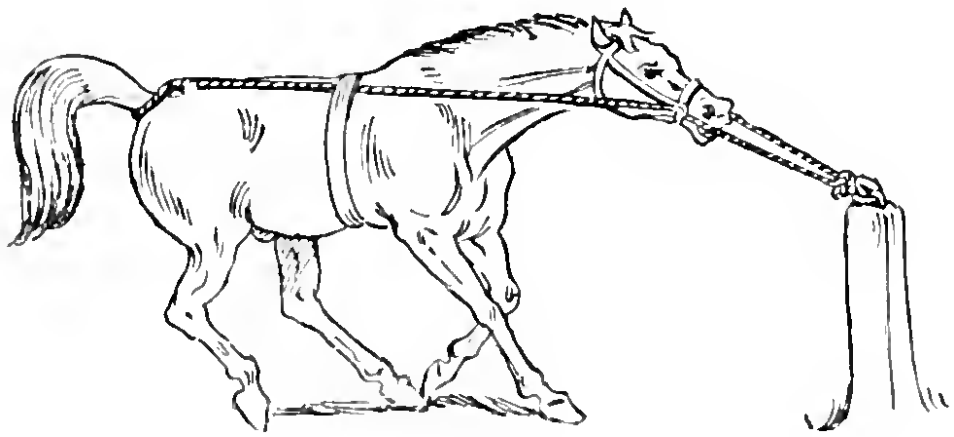


Fig. 15.

coming from there, instead of the head, where he expected it, he will start forward, it being natural to go from the hurt. There is no danger accompanying this, and if he is in the habit of pulling at night, this arrangement may be left on, without fear of the horse getting tangled in the rope. Common sense will show you, that, as there is no pull upon the head, and consequently no hurt there, he will soon cease pulling and lose the habit. To make the lessons still more effective, you may cause him to pull, by using such exciting means as are apt to alarm him.

10—BRIDLE PULLING—(ROCKWELL).

Put a rope under the tail in the same manner as in halter pulling, except that you pass the ends through the rings of the bridle, and tie him to a post where he is in the habit of pulling—unhitching the wagon, if one was attached. Step away and frighten him by whatever is apt to cause him to pull. As he pulls, the pressure coming upon the tail, he will step up to the post. Take hold of the rope between the post and his head and give it a few pulls back and forth. By these means, he will learn to step forward rather than to step backward. After a few lessons, he may be tied by a common tie-strap, the end, however, passing through the ring of the bridle bit and being tied to the back strap. Do this until you are satisfied you have effected a cure.

11—PUTTING ON THE BIT, (AFTER RAREY).

A smooth but thick joint-bit, with bars on either side, is the most proper for a young horse. This bit must be buckled into the head stall of the bridle at first without reins, checks and blinkers, and the horse be allowed to walk around free, in a large space, until he gets used to it, so as to make no attempt to free himself of the bit. These proceedings are to be repeated a few times, before going any further. Put, also, a halter over the bridle, as the

young horse will be more willing to be guided by the halter strap than by the bit, which it is not accustomed to as yet.

12—TO GET THE COLT USED TO THE BIT, (AFTER ROCKWELL).

Place on the colt an ordinary head stall with a joint bit without any check strap or reins. Leave him in the stable, or yard, for a short time, then remove the bit. Frequently replace it and allow it to remain on for a short time. By this means, which is a great improvement on the old way of putting on the bitting bridle at once, his mouth becomes used to the bit. After a few times doing this, the colt will be ready for

13—THE BITTING BRIDLE, (ROCKWELL). Fig. 16.

For this, first prepare a well-padded leather girth, with a large ring firmly riveted on to the centre of the girth, over the back and three buckles, six inches apart from each other and the ring. Put on a common riding bridle or head stall without blinds, and, under all circumstances, use a joint bit, gag runners (loops) being well placed up towards the ears, and the throat lash made large and to buckle very loose under the gag runner. The side-straps to be about six feet long with a snap at one end and holes for the buckle tongue at the other. Fasten the strap,

with the snap, to the ring in the centre of the girth pass the other end of the strap through the gag runner on the near side of the horse, passing it from toward the nostrils back through the ring of the bit. Draw it tolerably light and fasten in the buckle. Do the same on the offside. You will see that by

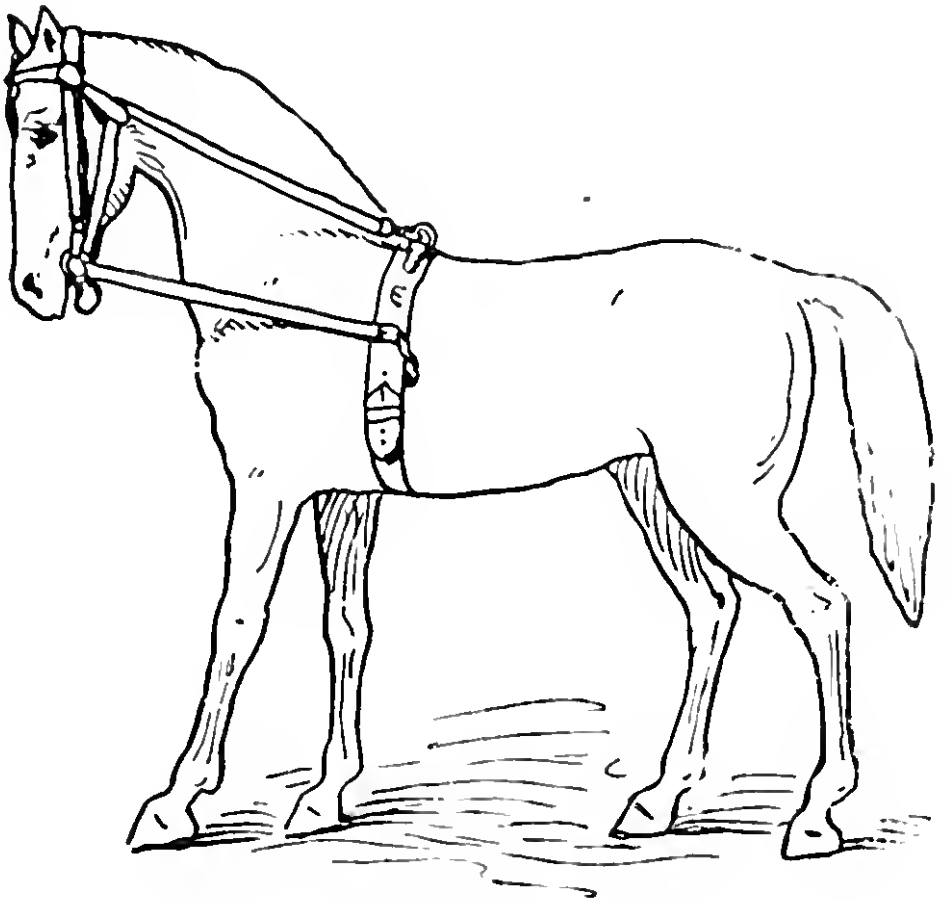


Fig 16.

fastening the strap well up toward the ring in the centre, it will compel him to hold his head high and throw the nose out. By fastening them well down on the side, it will lower the head and curve

the neck, at the same time giving him the power to move the head up and down with perfect ease. In cases, where bitting is required only for the purpose of suppling and developing the muscles of the neck, this bridle should be used, as no horse being geared in this bridle will be injured, in case of falling backward.

14—BITTING THE COLT, (ROCKWELL).

In placing the bitting bridle upon the colt, great care should be taken not to buckle the straps tight at first, as you might give pain, and alarm the animal. Be particular to have the throat-lash quite loose, so that it will not choke him. Many horses have been ruined by carelessness in this particular. In gearing him up, care should be taken, that the check is not too tight at first, lest he should, in rearing, go over backward and fall on the top of his head. Another reason is, that he will yield more readily to the side reins. The checking up should be governed by the length and form of the neck and shoulders. As soon as the colt shows a disposition to yield, the bridle should be removed or the straps loosened. This should be done within at least *five minutes* from the time it is put on. The oftener it is taken off and replaced for the first three days, the better. Do not however remove it while the colt is sulky and refusing to move his head. A lesson here to be taught

him, is, that he cannot be loosened from the restraint, *while he is resisting it.* This will prove useful in all future dealings with the animal. Should he prove unusually stubborn and refuse to yield, you may make use of what we denominate the "*Yankee Bridle.*" It consists of a common bridle head stall and a jointed bit with double rings, Fig. 17. Fasten the cheek

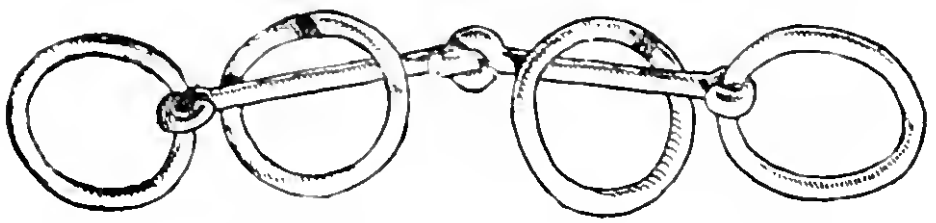


Fig. 17.

pieces of the head stall to the loose rings on either side and the reins or rope to the rings of the bit.

In using this bit on a refractory horse, take a rope about ten feet long, tie one end to the near side ring of the bit, pass the other end, under the jaw, through the offside ring of the bit, then bring the rope over the neck from the off side to the near side, placing it about where the collar usually comes. Then pass it down the near side, and through and over that portion of the rope which is between the two bit rings under the jaw. Now as you tighten upon the rope, see Fig. 18, you will perceive that the tendency of the two rings, attached to the cheek pieces, is to play loosely upon the bit and to move toward the

centre or joint of the bit, and that they will consequently press tightly upon the cheeks. The sensation which this pressure occasions, you may illustrate, by pressing inwardly upon your own cheeks with your

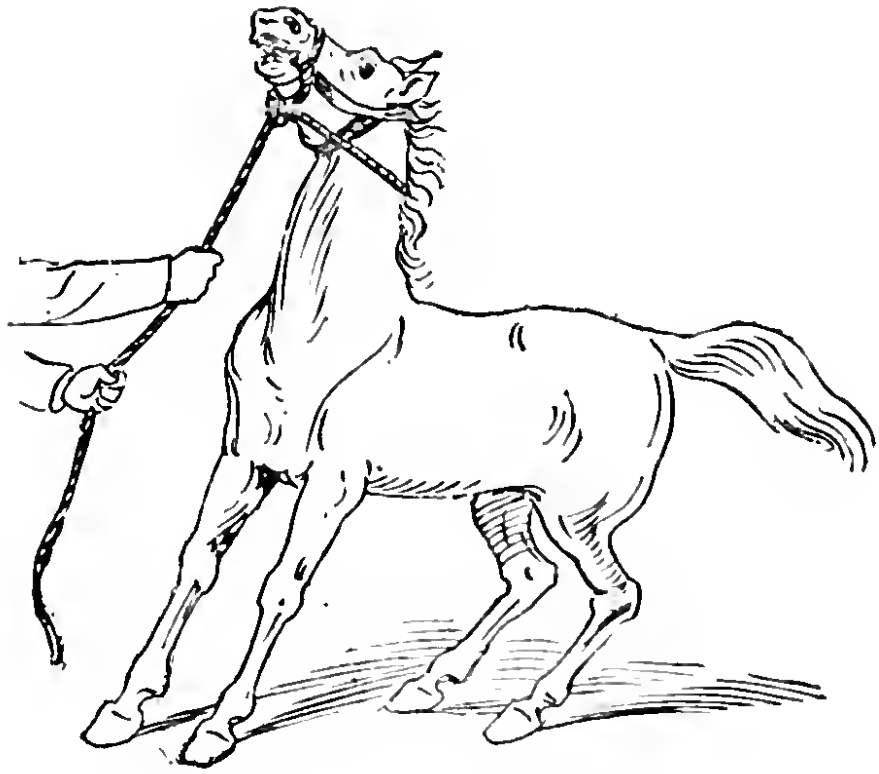


Fig. 18.

mouth partially opened. The effect upon a horse is instantaneous and irresistible. It cannot injure and is a safe and reliable controlling power.

15—SADDLING THE HORSE, (RAREY).

In putting on the saddle, take care that the stirrups do not hang down so as to touch the horse, thereby irritating and frightening him.

Sling a knot in the stirrup straps, put the saddle flaps together, take the saddle under your right arm, and walk slowly up to the horse. As soon as you are near enough, lift the saddle up gradually, and while caressing the animal, let him touch and look at it. Then open the saddle flaps and stroke the horse with the saddle gently, along the neck, to make him accustomed to the noise made by the pushing to and fro of the saddle. By and by, do the same with the saddle farther back, until you may finally put it over his shoulders and *gently* down on his back. Shake the saddle flaps and keep busy about the saddle, take it off again, put it right on again, and the horse will no longer offer any resistance.

Before these manipulations, examine the padding of the saddle so as to protect the horse's back from becoming galled by the saddle, then fasten it by means of the girths, quite loosely, just enough to hold it in place. To avoid frightening the horse, by fastening the girths, it is absolutely necessary to remove everything disturbing, for instance: loose tangling straps, etc. Put the straps, as gently as possible, around the horse, not pulling them tight, and lead the horse about.

After he gets a little used to the saddle on his back, tighten the girths slowly, as much as necessary, without irritating the animal. Take a whip in your

right hand, put your right arm over the saddle, and taking up the reins on both sides of the neck, with the right and left hands, walk the horse around until he gets sufficiently used to the reins and that you may turn and stop him by gently pulling the reins. As soon as he stands still, loosen the reins slightly. Always bear in mind to execute all these preparations with no other person present, but in a large stable, or some other enclosed space, where there is no danger of getting hurt in mounting the horse afterward. It is essential that you should talk to and caress the horse during and after every exercise. In this way you will accomplish more in hours than otherwise in months.

16—MOUNTING THE HORSE, (RAREY).

Having adjusted bit, reins, and saddle, the horse is ready to be mounted. Before you actually mount him, prepare him properly by caressing and stroking him on both sides of the saddle and over the whole body, and then gently and gradually make him accustomed to a pressure upon his back and to receive the weight of his master. This end you will not reach untill all fear is removed, and the animal has learned to stand still without being held, and not to get alarmed at the sight of the rider wherever he may be. The best way, to accustom the horse to

the weight of the rider, is to mount from a block of one to one-and-a-half feet high. As the horse is watching every change in the position of his master and is very apt to get alarmed by his suddenly jumping on the block, get on the block very slowly, allowing the horse to see you in the position of first having only one feet on the block, being the same position as when mounting the horse. If the horse does not show any fear, let the stirrups down gently, put the left foot in the stirrup, taking care not to touch the horse with the toes under the shoulder. The knee should be close to the saddle, the left hand taking hold of a lock of the mane, the right hand placed on the cantle of the saddle. Lifting yourself up a little from the block, let the horse gradually feel the whole weight of your body, first on the stirrup, then in the saddle. Be very careful in doing that, for it is the critical moment, and if done too rashly, it may spoil the animal for a long time. Repeat this exercise several times, each time lifting yourself a little higher.

The reason, for mounting from a block, is that the horse will not feel the weight of the rider at once, but gradually, and, besides, the rider is not compelled to spring, to get into the saddle, and lastly, the horse will gradually become accustomed to the high position, in which he will afterward see his rider.

17—RIDING THE HORSE, (RAREY).

As the fear of the horse is not entirely allayed yet, and it being easily alarmed and irritated by new impressions and unwonted handling, it is apparent that, to cause it to move on, the rider should not attempt to urge it forward by kicking it in the sides with his heels. Better caress and speak to him, and if he does not go forward then, turn him a little to the left, until he begins to move, permitting him to move slowly and with loose reins. Continue in this manner until the horse has walked around the enclosure for a few times and got used to the bit and reins, permitting you to guide and stop him at your pleasure. This exercise should not last longer than half an hour so as not to annoy him. Repeat the same twice a day for a few days. In dismounting, and taking off the saddle and bridle, use the same precaution, not to alarm the horse. Withdraw your right foot slowly from the stirrup, with the left hand take hold of the mane and reins, lift your leg slowly over the croup, being careful not to touch the horse with the boot, and let yourself slowly down to the block or ground, all this time speaking to the horse. Repeat mounting and dismounting several times during each lesson.

After a few days the horse will be quiet, and it will then be time to take him outdoors. There it will

naturally be inclined to gallop, to jump, and to shy, and care should be taken to remove every object apt to excite the animal.

In mounting the horse outdoors, take the left rein, short, so as to enable you to hold him and to draw his head toward you in case he should shy or step sidewards.

If the horse entirely refuses to move on, after the rider is in the saddle, turn his head to one side and thus the horse several times around in a circle. If then let loose, he will without using the whip, be glad to move forward.

It is quite improper to use a martingale at the first lessons of the horse under saddle, as the animal will more willingly submit to the guidance of the hand, if the pull of the rein comes in a straight line, as if that direction were broken by the martingale. The use of a martingale may only then be justified, if the horse carries his head too high, or stretches his nose too far out.

18—RIDING THE HORSE, (ROCKWELL).

This should not be done before the horse is well bridle broken. Begin the lesson in the barn or yard. Place on him a common riding bridle without girth or martingale. Tie the bridle reins together on top of the neck, tight enough to check him just a little.

Stand on the near side, near the shoulder, throw strap across the withers, near where the reins lie. Quietly r ach down in front and caress the fore legs, and as soon as the horse is sufficiently calmed, tie the strap to the off leg, just below the fetlock. If he is restive and prevents you from tying it, or shows signs of striking or kicking, take him by the head and tail, the left hand well up to the head, and whirl him around two or three times, and while he is disconcerted by this movement, stoop and tie the strap. Then take hold of the near rein, within about four inches of the head, and with the right hand draw up the strap so as to pull the foot clean from the ground, at the same time, pulling on the rein toward you, quite firmly, until he has made two or three hops on three legs. The points, to be gained by this, are: first, you teach the colt that he is not to be hurt and that he cannot get away. This tends to prevent his *plunging* when you afterward attempt to ride him. Second, by putting the strap across the back, it accustoms him to bear a weight upon his back. Third, it prevents him from throwing himself over backward. Fourth, it accomplishes your desire in a safer and quicker way than any other known. Now take a shorter hold on the strap, with the foot held up, passing your right arm well over his back, with the left hand take hold of

the reins and mane near the withers, and then make the motion of mounting. Do this a few times until the colt gets accustomed to the new positions and movements. Then gently mount him, the foot being still held up. Now let down the foot and start him along. If he shows signs of being restive, or attempting to throw you, pull up the foot and caress him. He will not fall down while the foot is up, as it might be supposed he would. Keep well hold of the foot strap, untie the knot in the reins and letting down the foot, commence turning him from side to side and urging him forward. If he is unwilling to start, take a whip into the same hand, with which you hold the foot strap, and gently touch him with it on the off hind leg, just back of the stifle, gradually increasing the blows until he starts, at the same time loosening the reins. In turning him, use caution, and do not pull upon but *one* rein at a time, for the reason, that, if you pull on both, the colt will be apt to run backward, sideways, or otherwise act awkwardly. Do not ride him very far the first time. This lesson with the foot strap should be repeated three or four times, until the colt is accustomed to your presence upon his back, and to your legs against his side. Having never been thrown from a colt, since I adopted this plan, I firmly believe that no better method of training the colt to ride, is known.

BREAKING THE HORSE TO HARNESS.

19—HARNESSING THE HORSE, (ROCKWELL).

The same precautions should be used as in saddling the horse. After the harness is put on carefully, put on a bridle without blinds, and walk him around the yard, or allow him to remain in the stable for about half an hour, to become accustomed to the rattling of the straps and the feeling of the harness in these unwonted positions, then remove the harness. After a while, put the harness on again for a short time, and again remove it a few minutes after. The third time you harness the horse, pass the traces through the rings of the breeches and tie them, drawing the traces and the breast collar pretty snugly together against the body. After a little while, you may commence to drive him with the reins, turning him in different directions and gently urging him forward, impressing upon him the fact, that you control him, thus teaching him to obey the reins and to go without leading. Be careful each time to repeat the word "*whoa*" at the same moment you pull on the reins to stop him. This exercise usually

occupies three days' time. As soon as he appears handy with the reins, you are then ready for

20—HITCHING UP THE COLT, (ROCKWELL).

If possible avoid hitching him up, single. If it is necessary, to do so, be particular to place him in the shafts as quietly as possible. As there is no danger attached to this transaction, we have no established rule, leaving the operator to be governed by circumstances and his own judgment. Before hitching him to a wagon, rattle the shafts, shake the wagon, walk him out and in between the shafts, lead him in toward the wagon, uncheck him and allow him to examine in his own way the object, so new and terrifying to him. You must accustom him to the wagon, or there is danger. If he continues frightened, in spite of these efforts, it will be well to let him go for a while. Then try again, until he gets quiet. You may then hitch him to the wagon, and drive him very carefully on level ground for a few minutes, for the first few times avoiding backing and turning, if possible, being careful for a few days to give only short drives. Three miles and back, afterwards, will do no harm, gradually toughening the colt to do your work.

Our method, however, and the only one that can be *safely* used, is to hitch the colt up alongside of a broken horse, putting him on the offside. There are

several reasons for hitching on the offside. It is usual to jump from a wagon on the nearside; and in this act, if any accident shall happen, such as yourself falling down, or any other movement, likely to alarm the horse, he may start, and, if he were on the nearside, he would wheel around *from* you, and perhaps do damage, before you got within reach; while, if he was on the offside, he would, if frightened, wheel *towards* you, the broken horse being likely to remain steady. Another reason is, that the operations with the colt have, thus far, mainly been on the nearside, and it will not seem quite so strange to him, to have a horse on that side.

The harness, being on both horses (quite loosely on the colt), with long inside reins, you will buckle a strap around the near fore foot of the colt, just below the fetlock, with an inch ring slipped on the strap. Tie a long line to the ring, pass it under the girth of the colt, bring it up on the outside of his trace, and hold it in your right hand. The driving lines hold in your left hand. You will then drive the team about. As you start them, promptly and decidedly, use such word as you choose, never varying from the same word, frequently pull up the lines and say: "*whoa*," at the same time, draw upon the line, attached to the foot, until the foot is lifted from the ground and held there, leaving the colt

standing on three legs, in spite of his struggles. After a few times doing this, you may unharness him, as this is sufficient for the lesson. When ready to hitch up, which you may do now at your leisure, you will do as before, and after a little driving, hitch the team to a wagon and get in. You may now start off slowly, stopping the team once or twice, while on a walk, saying, "*whoa*" as before, and pulling up the foot strap. You will now readily perceive, that you have perfect control over the colt's movements, whether on a walk or trot, without any danger to the colt. The colt will not stumble, strange as it may appear, it being almost impossible for him to fall by this means while in motion. A long experience warrants this statement. Short and lively drives are what you now want, until the colt becomes broken and obeys the rein and word, "*whoa.*" You may then change sides with him, to teach *the other side of him*, of course, changing the foot strap to the inside, each time. When he has by these means become accustomed, to being handled freely, you may hitch him up, single or double, as you choose, for he is now ready to drive.

21—TEACHING THE COLT TO BACK, (ROCKWELL).

This should not be attempted, until the colt has been driven at least eight or ten days, nor until the

habit of readily stopping, starting, driving and obeying the reins has been formed. If you adopt this rule, no colt will balk, throw himself down in harness, run into a fence, or refuse to stand while the driver is getting into the carriage. When sufficient time has elapsed to warrant you in undertaking to teach him to back, take a common bridle — a bitting bridle is best — and begin by taking hold of the side reins, standing in front of the colt, gently pushing backward, saying, "*Back*," at the same time he steps back. This you will repeat, until he readily takes two or three steps backward, when you will release him for the present. At the next trial, you may put on the reins and take your position behind him, passing the reins through the side rings of the strap, or, if obliged to use a harness, passing the reins through the shaft straps, holding the reins well down by his side, to prevent him from turning round and facing you. Have him loosely checked. As you step behind him, pull gently on the reins, and as he steps backward, say, "*Back*," and immediately slacken the reins. A half an hour's exercise is usually sufficient at a time, repeating the operation until he backs readily. It is well, to give him one or two sharp steady pulls, for eight or ten feet backward, just before leaving him each time. He is now ready to be hitched up, as you usually hitch up your horses, and

ready to form the habit of backing to wagon at the word. Be careful for the first few times not to ask him to back with a load, each time having the wagon in a favorable position, as descending ground, when the attempt is made. By using this precaution, the colt will soon learn to be handy, and practice will perfect him.

22.—REFUSING TO PULL, (BALKY.)

Any faults, on the side of the horse, are generally the consequence of false treatment, and the best proof for this assertion is the refusal of the horse to pull. This opposition is not founded in the nature of the horse, but only occurs in a certain state of the same, as: excitement, perplexion, etc., brought about by irrational treatment. It often happens, that a lively horse, hearing the voice of his driver, will jump in the harness, thereby not moving the load, but receiving a jerk on his shoulders, which throws him backward, and which at the same time will stop the other horse. The driver generally continues to urge the horses on. Before the quiet horse begins to pull, the lively one has made another plunge and is again thrown backward. The quiet horse, not being able to pull the load alone, will also become perplexed and will stand still, not knowing what to do. Oftentimes, then, they have to suffer from the stu-

pidity of the driver, who whips them in his blind rage. But this makes matters worse, the horse gets obstinat · and the next time he will be sure not to pull at all.

If a horse refuses to pull, be kind to him, caress him, allay his excitement by speaking and stroking his neck, and leave the team alone, for ten or fifteen minutes. Then urge them on again, turning the horses a little to the right and left, so as to get them in motion, before they feel the pressure of the load behind them. Drive about twenty paces and stop again, before the balky horse stops on his own account. Then caress and start again.

In correcting such a horse, it is a good plan to first hitch him with a quiet horse to an empty wagon, tie the traces of the quiet horse a little shorter, so as to cause him to take the load alone at first starting. By this means, the excitable horse will become accustomed to walk by the side of the other horse. You may then hitch both horses equally long, drive up some hill, first with the empty wagon, then with a load on, and you will surely get the horse to pull.

23—TO DRIVE WILD HORSES; OR, SUCH OF VICIOUS HABITS, (RAREY.)

The manipulations are similar to Rockwell's method, described in "*Hitching up* the colt." Rarey

says: It is only necessary to tie up one fore-leg, so that the hoof points upward, nearly touching the body. The horse, then standing on three legs only, is not able to kick, but you may do with him, what you please. Should he begin to jump or get wild, he will soon quiet down, seeing the futility of his attempts to free himself. As soon as he gets quiet, untie him again, stroke his leg, caress him, give him a little rest, and tie the leg up again.

The next step is to lead the horse about until he has learned to walk on three legs only. Then hitch him to a small, light wagon, and let him walk at leisure. Being unable to kick or run away, you have nothing to fear. You may safely give him the reins, and even use the whip. He will soon tire out and stop on his own account, even if he were the wildest horse that ever had a harness on.

The horse, being first alarmed, with such treatment, as soon as he perceives that no harm is done to him, will quiet down and pay no further attention to the harness. This is the best cure for the vice of kicking.

24—TO TEACH A HORSE TO LIE DOWN, (RAREY.)

Bend the left fore foot in the knee, put a strap Fig. 19, around the fore arm and fetlock, so that he cannot sat his foot down on the ground. (Fig. 20).

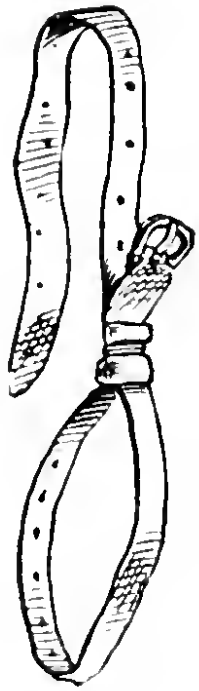


Fig. 19.

Place a girth around the horse's body, fasten a strap with an inch ring attached around the horse's right fetlock, tie a strap or rope into this ring, and draw the strap through the girth under the belly, Fig. 20. Standing on the left side, take firm hold on the bridle rein with your left hand, near the bit, and while pulling the strap with your right hand, press against the shoulder of the horse, until he moves. As soon as this happens, lift up the right leg by a strong pull on the strap, and he will sink down on his knees. As the horse may begin to struggle, take a firm hold on the strap, so as to prevent him from regaining his feet. If he rears up, turn his head toward you, Fig. 21, and he will soon get tired and sink down on his knees again. Crowd with your shoulder gradually, not violently, against his side, and after, perhaps, ten minutes, he will turn over on

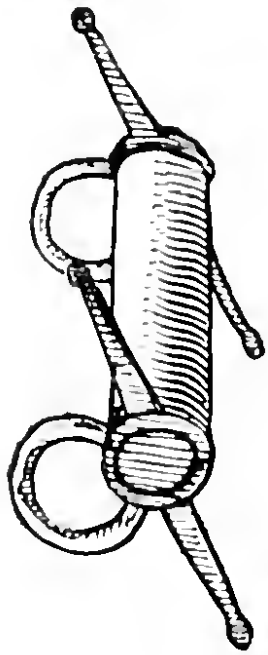


Fig. 19*a*

his right side away from you, and you can do with him what you please, Fig. 21*a*. Another way is, after the horse is on his knees, to pull his head sharply to the right, until he gets tired, loses his balance and will fall over to the left or toward you, Fig. 20*a*. Unfasten the straps, stretch out his legs, caress and stroke his neck, speak to him gently, and after about fifteen minutes, allow him to get up

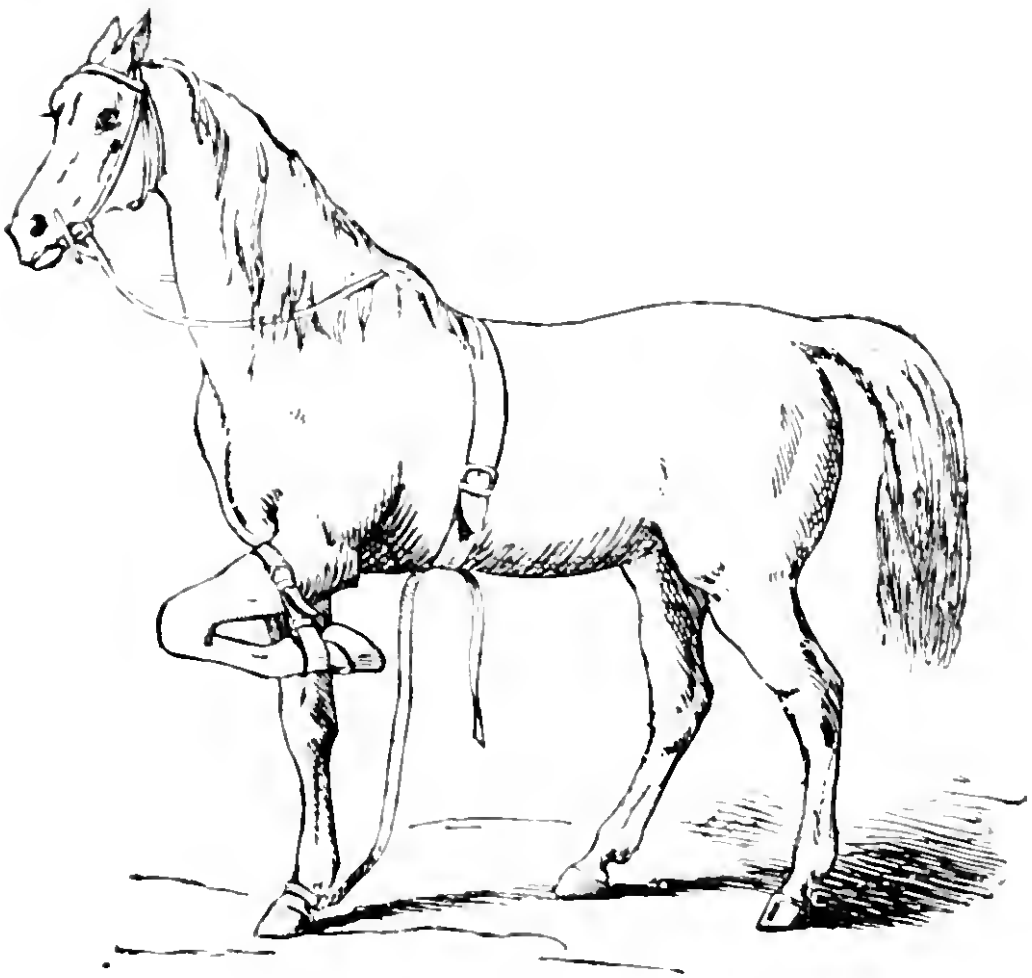


Fig. 20.

again, using the words: "*Get up.*" Repeat three or four times in one lesson, and give two lessons a day. After four lessons, the horse will surely lie down without these resources, by simply lifting up one leg and touching the other at the knee, with a whip.

Fig. 20*a*.

25—THROWING A HORSE, (ROCKWELL).

The easiest and most effectual method of throwing a horse, is to strap up the near fore foot, put on a surringle with a ring fastened to the top of it; tie a half-inch rope around his neck in the same manner you would hitch him by the neck; place it

Fig. 21.

Fig. 21*a*.

up near the throat lash with the knot on the near side; pass the rope through the mouth and bring it along his neck on the off side, and pass it through the ring on the back, standing back on the near side about six or eight feet from the horse opposite his near side hind leg, drawing the rope sufficiently tight,

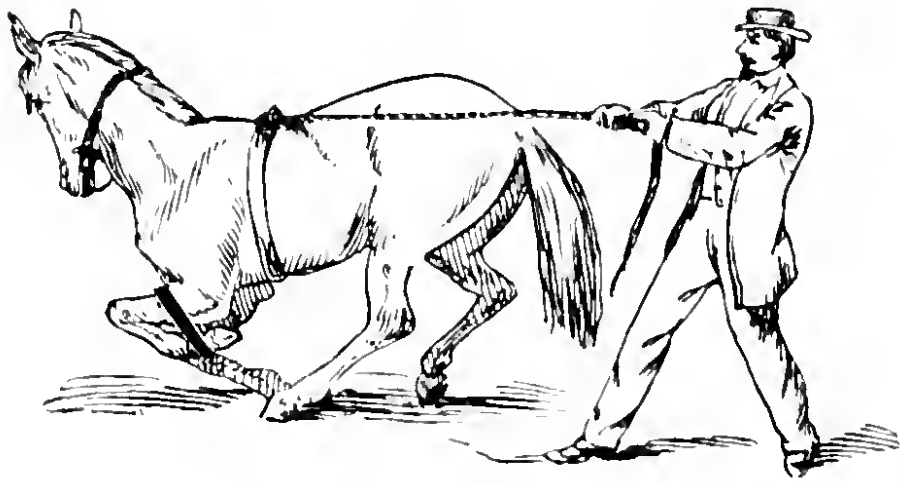


Fig. 22.

to keep it in the mouth. Pull carefully until he yields his head a little to the off side; then give a sharp, strong pull, and keeping your hold, pull sharply, until he is down, Fig. 22, which will occupy from one to five seconds. As he goes down, lying upon the near side, you keep the rope tightened and he cannot get up. By repeating this, you will soon make him quite a trick horse, as he will learn to lie down, by simply pulling on the off bridle rein. Throwing is often necessary in surgical operations, and, as the horse may be thrown on either side and

with perfect safety, by this plan, it is preferable to the old way of throwing by main strength.

26—TO TEACH A HORSE TO FOLLOW HIS MASTER, (RAREY).

Take the horse into a large stable or barn, step up to him, take hold of the halter, and touching him with a long whip gently over the loins, turn his head toward you. Then lead him on the halter strap, through the stable, caressing and speaking to him, using the words: "*Come here, Sir!*" and, as often as you turn around, touch him with the whip to cause him to step up close. Should he stop and turn around, administer a few sharp cuts with the whip around his hind quarters, causing him to turn his head quickly toward his master. After each touching with the whip, caress again. To avoid the touch of the whip, the horse will soon come up on his own account to be caressed, without being pulled by the halter. After a lesson of half an hour, it will follow his master through the whole stable.

After the stable lessons have been repeated three or four times, he must be taken out of doors and the lessons repeated until he is safe.

27—TO CAUSE THE HORSE TO FOLLOW YOU, (ROCKWELL).

To cause him to follow you while his head is confined with a bridle or halter, put on the "*Yankee*

Bridle." See Fig. 18. Take hold of the rope about two feet from the head, give him a few short, quick side pulls to the right and left, then, taking quickly hold of the rope farther towards the end, as you step back, say decidedly: "*Come here, Sir.*" If he comes forward, caress him; if he does not come, give him a pull with a sideways tendency, and repeat the attempt to have him come forward, until he does come; then start off either to the right or left, with the rope slackened; if he does not follow you, give him more pulls sideways and try him again. With an ordinary horse you can teach the lesson in ten minutes, so as to be followed by him when you are near the head. Step partially behind him, laying the rope along his back, and say: "Come here, Sir." He will not be likely to do it, because he has only been taught to go *forward* at the words. To teach him to follow you in this direction, you will then chirrup to start him, repeating the words. If he comes, caress him; if he does not come, or moves in the wrong direction, pull upon the bridle, caressing him as he obeys. The same rule will apply to any direction in which you wish him to follow you. It is quite necessary to teach the horse this habit, as it is the foundation of many others, and is one of the most valuable which the horse can possess.

To teach him for your amusement to follow you when entirely loose, put on the near fore foot, a long foot strap, and place on him a girth; and holding the end in your hand, step away from him; then step toward him and if, he attempts to step away from you, pull up on the strap and say: "Whoa." If he stops, step up and caress him; repeat until he will allow you to step up to him without moving away. Now take a short, blunt whip in your right hand, and the strap in your left, standing by his side, pass your right arm over the withers and gently touch him on the offside of the head; if he starts to move off, pull up on the strap, and say: "Whoa." When he turns his head, caress him gradually with the whip, forcing him to turn his head around toward you. When he will do this, every time you put the whip over, you may remove the foot strap and practise him in the lesson, until he will come to you, every time you lay the whip across his neck; then put on the foot strap again, put your whip in the same position and hit him in the same place quite hard, at the same time, saying: "*Come here, Sir.*" After a little, he will be very prompt; then place him in a corner and step off at a distance of eight or ten feet, and say: "*Come here, Sir.*" If he comes, caress him; if he does not come, hit him gently on the breast with a long whip. He will, perhaps, struggle

to get away, and if he attempts to get out of the corner, pull up on the strap. When he faces you, step up to him and caress him, placing him back in the corner and repeat. If he finally shows a disposition to follow, step back coaxingly, and when he stops, caress him; at each further repetition use the words: "*Come here, Sir,*" at each motion of the whip. In this way he will soon learn to follow you at the word, if you have a whip in your hand. Don't take him out of doors to practise until he is quite perfect, and then begin in a small yard and alone.

28—TO TEACH THE HORSE TO STAND STILL WITHOUT TYING, (RAREY).

After the horse has learned to follow his master, make him stand in the middle of the stable, caress him at the head and neck, and gradually farther and farther back. As soon as he moves or walks away, give him a sharp cut and take him back to the place where he first stood. If he stands quiet, caress him by moving all around him. Each time he moves, administer a cut and begin again. He will soon stand still; walk faster around him, touching him only now and then; move around him in wider circles, and if he stands still, step up to him and caress him, and continue the circling. Don't leave the horse too long on the same spot, but walk him for a

change through the stable, and repeat the lesson on another spot. The lesson should not last longer than half an hour.

29 BAD TO BRIDLE, (ROCKWELL).

With the "Yankee Bridle," Fig. 18, pull his head down and gently handle his ears. When he will allow you to do so without trying to get his head up, loosen up and allow him to lift it. If he is inclined to strike with the fore legs, put on the halter and tie him to a post, then apply the "Yankee Bridle" sharply, keeping at a distance; then approach him, keeping the halter pulled tight by means of the rope in your hand, and pulling his head down, handle his ears gently. When he allows it quietly, caress him. If he is inclined to back, back him into a stall and repeat. In half an hour he will allow you to handle his ears to your liking. Repeat whenever he shows signs of returning to his old habit.

If you have no time to break him, in putting on the bridle, pass your right hand under the neck, take hold of the nose from the opposite side; with your left hand pass the bits into his mouth; take your hand from the nose, and with it carefully put on the headstall, while your left hand is in the mouth working at the bit, shaking and fumbling it to keep his attention, until the headstall is properly placed.

If hard to put the bit in the mouth, pass your right hand around under the neck, and take hold of the nose. With the left hand press the lips against the bridle teeth, before the bit touches the teeth. This will cause him to open the mouth. To break up the habit, use the Yankee Bridle while bitting, passing the bit in and out, hitting the teeth each time. This will cure him.

30—BAD TO BACK, (ROCKWELL).

Use the Yankee Bridle, and tie the horse to a ring in the wall with a long halter strap. Lead him past the wall with a long halter strap. Lead him past the ring as far as the halter will allow, and from the opposite side from the halter, pull back upon the Yankee Bridle. Do not use at this time any words. Continue this until he backs readily at the pull, then begin using the word, "Back," and repeat until he understands the meaning of the word and will back upon being told to. Do this next in harness, and if necessary after he is hitched to wagon. There is no difficulty in soon fixing the lesson upon his attention, so that he will never forget it.

31—HARD PULLERS, (ROCKWELL).

Give a horse which pulls upon the bit, all the road he wants, and let him go. If he goes too fast, jerk upon one line and then the other, slacken

up and let him go again. If this does not answer, drive him with the Yankee Bridle, without the rope, attaching the lines to its bit without martingale.

32—SHOEING THE COLT, (ROCKWELL).

To *prepare* a colt for shoeing the first time, tie a long strap around his neck, pass it along the near side, between the hind legs, and bringing it around the near hind leg, close up to the body, pass it under the strap around the neck; then draw upon the strap, holding him meanwhile by the bridle. The colt will probably be nervous at the pull, and you will loosen it and caress him over the face and neck, gradually tightening at each successive pull, using no words but gentle ones, and not saying, "Whoa." When he has become accustomed to that, lower the strap to a point just above the hock, and gradually pull upon the strap until you lift the leg, at the same time pulling upon the bridle with a side or back pull, to prevent his stepping forward.

When you have thus succeeded in easily lifting the leg pretty well up, you will find that you can take it up with your hand and hold it. The same process must of course be gone through with on the other leg, and after about ten lessons, your colt is ready to go to the blacksmith. The rule has usually been to take the colt to the blacksmith first, but he

is more than apt to get bad habits by being forced into position to be shod and probably gets wounded to his injury, if the blacksmith's stock of patience is not very large. Shoeing should always be done as the feet grow tender, and if quite young, shoe very often.

If a horse does not submit quietly to be shod in case he is nervous, no good will come of the blacksmith dealing roughly with him, beating and otherwise maltreating him.

Another simple and effective way to overcome the difficulty without resorting to violence, may be found in the following:

Tie a light, but strong rope or strap on the lower jaw, keeping the tongue above. Fasten a ring in the tail, and another near the month, in the rope; then pass the rope through the ring in the tail and back through the ring near the mouth. Then pass the rope back of the horse and draw his head to one side, while you shoe his feet on the other side. Reverse the rope to shoe the other side.

In *shoeing horses for corns*, care must be taken that the corn be well cut out and a little butter of antimony or muriatic acid, applied to the part affected. The hoof from the corn backward must be cut away, so that no part of the heel strikes the shoe, avoiding pressure, and relieving the part from unnecessary

concussion. A horse thus shod, no matter how bad his corns may be, will travel sound and with perfect ease, that otherwise shod would be decidedly lame.

In *shoeing for quarter-cracks* care and judgment is required. The horse should be shod precisely on the same principles as for corns; a bar-shoe often recommended, is unnecessary.

Properly shod, there will be but little trouble in growing out a sound hoof. The least pressure upon the heel of the shoe will be sufficient to prevent the hoof from growing down, and thus defeat any efforts which may be made toward remedying the injury. So soon as three-eighths or half an inch of new horn has grown down, the roof should be burned with a red-hot iron just above the crack, at right angles with it, which will prevent its breaking up anew. A little tar or hoof ointment should be kept upon the part, which will protect it from dirt and assist in hastening the growth of the new horn, usually requiring six to nine months for the crack to grow out.

33 — STRIKING AND KICKING WHILE SHOEING, (ROCKWELL).

Some horses, especially stallions, are in the habit of *striking* with the fore legs, if the attempt is made

to shoe them. Tie up the left front leg, stand on the other side of him and pull his head toward you. In this way he cannot strike, and the blacksmith will meanwhile shoe the leg tied-up. Do the same with the right fore leg.

For *kickers* take a long rope, tie it around the neck with a slip-noose knot (placing it well down on the neck) pass it between the fore legs, bring it around the near hind leg just above the hock and pass it through the portion around the neck which gives you a means of holding the hind leg. This will convince the horse that he is over-matched. Pull up the hind leg with one hand, and on the Yankee Bridle with the other. If time is important you will find it advisable to shoe him while thus held, which can be done with a little inconvenience, changing the straps as you change legs. Every time you do this without hurting him goes to help cure him. The same rules will apply to mules, though mules are controlled easier.

BITS AND BITTING.

The art of bitting a horse properly is so little understood, that it would seem that some hints about the conformation of a horse's mouth and the place where to locate the bit, might be appreciated by those who take a lively interest in the well-being of our dumb, patient friends; the same time reaping for themselves the benefits derived from proper bitting:

The many complaints we so frequently hear: "I dont know what makes my horse pull so hard"; or, "what makes him poke out his nose"; or, "he does not come up to the bit", etc., would very soon cease to be heard. Unfortunately, the bitting of horses is generally left to persons who have not the faintest knowledge of the anatomy of a horse's mouth, and whose faculty of reasoning does not go a great way. They conclude a bit is a bit, and toss the same up as high as possible into the "critter's mouth," but, beyond that, they don't bother their poor brains. Whether the master rides or drives comfortably or not, an accident happens or not, they don't care much. At any rate, it is never their fault—"the hoss is no good anyhow." When will the time come that gentlemen take a personal interest in these matters

by studying the very simple laws of nature, thereby making themselves independent from their grooms, and the stories they tell them about their horses.

There is nothing more awkward and difficult to manage, than a horse with a bit not perfectly adapted to his mouth, and to his whole frame or one that has been ill placed. Many an otherwise excellent horse has been put down as a worthless brute and sold, and all on account of improper bitting.

There are *three dimensions of the interior of the horse's mouth*, which must be accurately ascertained before attempting to fit him with a proper bit.

The first is the transversal width of the mouth, from side to side, measured at a point directly opposite the chin groove.

The second dimension is the distance of the bars or the width of the channel in which the tongue lies, and which determines how much of the mouthpiece may be allowed for the port.

The third dimension is the height of the bars, or, the distance between their upper surface and the bottom of the chin groove.

The mouthpiece ought to be just so wide as to fit the horse's mouth snugly. If wider, it will slip from side to side, and the edges of the port if there are any—press upon the very sensitive bars, causing the horse intolerable pain; to avoid which,

he will either poke out his nose or creep back behind the bit, sometimes with very serious consequences as: rearing, bolting, plunging, etc. If the mouthpiece is too narrow it compresses and chafes the lips, and by displacing them so that the folds cover the bars, the direct action of the bit on the latter is neutralized, and the horse becomes numb in the mouth.

The width of the *port*, which in most bits we see is from one-half to one inch too wide, must correspond exactly with the width of the tongue-channel at the point opposite the chin groove, and which is exactly one and a third inches. This being the proper place where the mouthpiece should rest in the horse's mouth, the width of the port, therefore, should be the same, viz: one and one-third inches, or, even slightly less, say: one and one-quarter inches, to avoid bruising the bars as mentioned above. The sole purpose of the port being to make room for the tongue, its height should not exceed five-eighths of an inch, as being sufficient for any horse. The higher the port, the greater the danger of injuring the roof of the mouth when pressure is brought upon the reins, and of making the horse restive.

Horses' mouths are very different in formation and size, but the heighth of a horse's bars is nearly

constantly one and three-fourth inches, therefore, the length of the upper branch of the bit should be exactly the same, meaning the distance from where the curb hook rests, in the upper ring, to the centre-line of the mouthpiece where that is riveted to the side branches.

Thus, we get a right-angled triangle, formed by the upper branch of the bit, an imaginary line drawn from the mouthpiece to the chin groove (both being one and three-fourth inches long), and the curb chain. Only under these conditions can the chain rest in its proper place, that is, in the chin groove, and act as a fulcrum to the leverage of the bit. The chain thus remaining stationary, causes the horse no pain, and it will yield readily to the pressure of the mouthpiece on his jaws.

The upper branch of the bit being one and three-fourth inches, the lower one should be three and one-half inches, to be in the ratio of 1 and 2—with very big horses three and three-fourth inches—giving the rider all the necessary lever power for controlling the horse.

The bit put into the horse's mouth, the mouthpiece should be placed right opposite the chin groove, the curb chain twisted so as to be perfectly smooth and hooked in, so that there is room for the first three fingers of the hand, when put between chain and

chin-groove. If the reins are then pulled, the side branches of the bit will form an angle of about 20 degrees with the mouth.

If the upper branch is too long, the curb-chain will mount *upward* and press upon the sensitive outer parts of the jaw. Moreover, there will be no lever action, and the horse will, therefore, bore in the rider's hand—the bit *stands stiff*. On the other hand, if the upper branch is too short, the bit *falls through*, the curb will, no doubt, remain in the chin-groove, but, forming a very acute angle with the branches of the bit itself, will have no

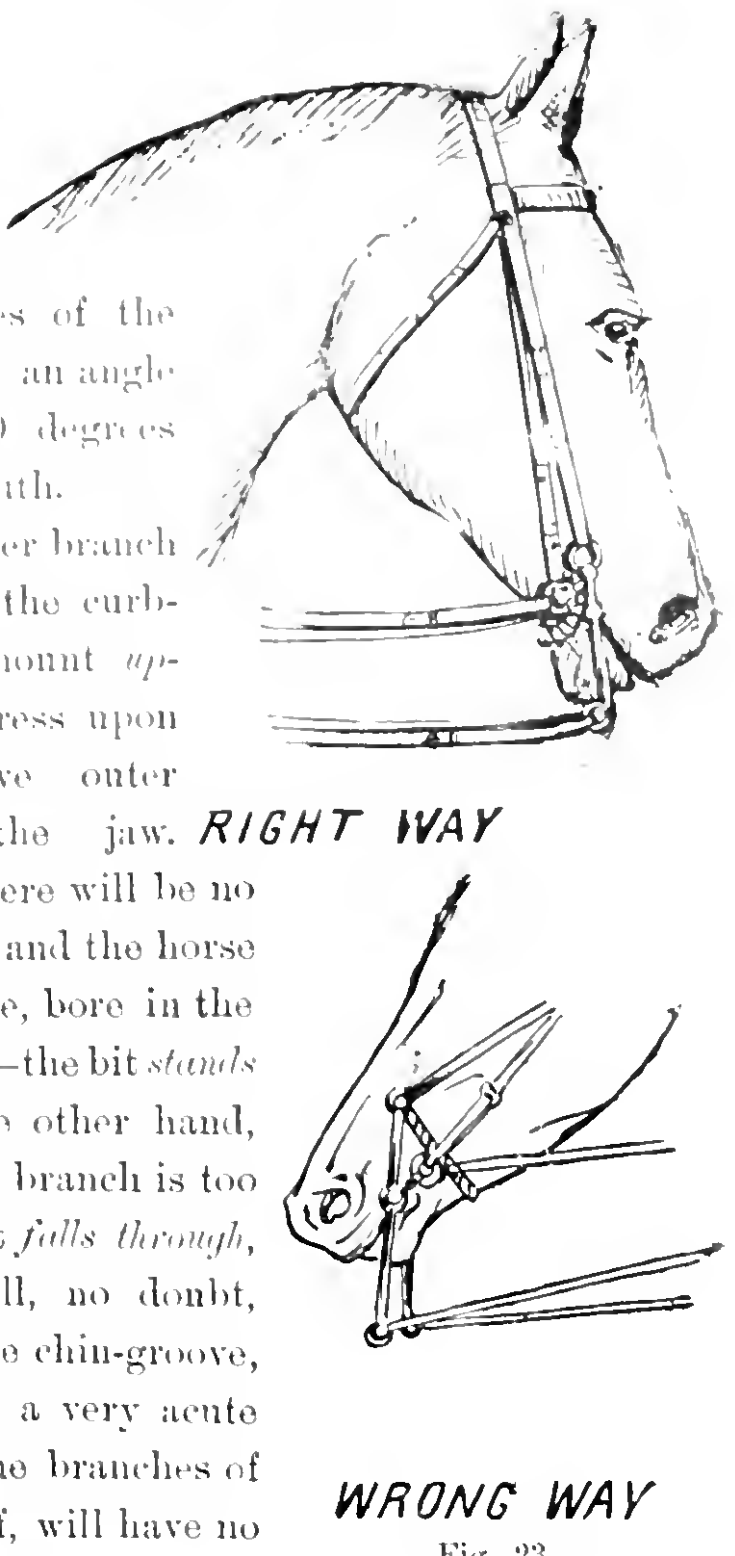


Fig. 23.

value as a prop, but the lever action will be too great. It will be now easily understood how it comes that people, in order to prevent a bit with very short upper branches, from falling through, are driven to use a very tight curb, the result being that the whole action of the bit is transferred from the interior of the mouth to the chin. In order to prevent a bit, with very long upper branches, from standing stiff, they use a very loose curb, which has the effect of making the bit fall through; or, what is very common, a bit, with very long upper branches, is pulled up as high as it will go into the horse's mouth, and then, either a loose curb is attached, in which case this great piece of ironmongery, of course, falls through, and has not the expected effect; or, they put the curb-chain very tight, in which case the chain rests above the chin-groove, hurting the horse considerably with the result that it will bore in the rider's hand, and try to run away. Whereas, a much smaller and lighter bit, if adapted to the month, would be much more efficient.

The structure and size of the horse's bars and tongue must also be considered, as those factors determine the thickness of the mouthpiece. A horse, with fleshy bars and a thick tongue, needs what is called a *sharp bit*, viz: a thin mouthpiece, one-half

inch in diameter. A horse with high, sharp bars, and a fine tongue (the characteristic of well-bred horses), requires a *very light* mouthpiece, viz: three-quarters of an inch in diameter. Thus the thicker the mouthpiece, the lighter the bit.

Sometimes we meet with the erroneous idea that it is the actual weight of the bit in pounds and ounces which constitutes a light or a sharp bit, and that the lighter ones are: "Ladies' bits." A light bit, under these suppositions, in a lady's hand, might prove the cause of serious misunderstandings between the fair rider and her horse. It is the horse and not the rider, that carries the bit, and a few ounces more or less, do not make the slightest difference. Nothing but the conformation of the horse's mouth should guide us in selecting a bit.

Some bits have *movable mouthpieces*, which to a certain extent, make horses light in hand, as they play with the mouthpiece, but the mouthpieces cannot prevent the horse from putting his tongue over the bit, and through the constant friction, the mouthpiece soon becomes loose at the sides where it is inserted in the side branches, and the horse's lips grow sore from being pinched and chafed.

Some horses acquire the bad habit of placing the *tongue over the bit* and lolling it out in front, or to one side. It generally originates from bad and se-

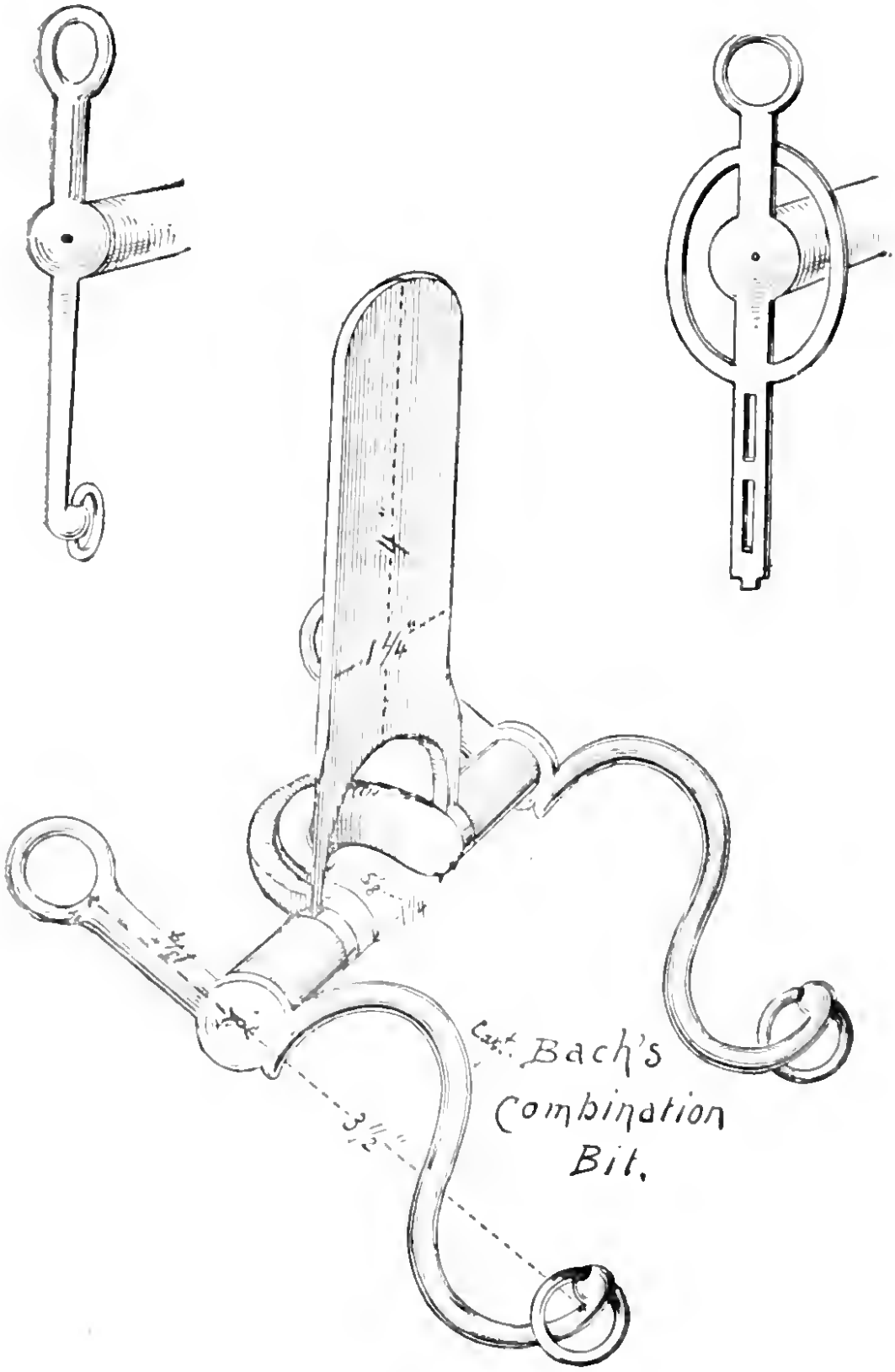


Fig. 21.

vere biting in connection with a fleshy tongue, in which case the mouthpiece cuts the latter, thereby stopping the circulation of the blood, and causing severe pain, to escape which the horse draws his tongue back and places it over the mouthpiece. This makes matters still worse, as then the edges of the port, which as before stated are generally too wide, press into and bruise the sensitive bars. The horse will then either pull hard against or shrink back from the rider's hand, rendering him often quite unmanageable. With carriage horses this lolling out of the tongue is generally the result of the bearing reins being too short.

Other horses again form the dangerous habit of *grabbing at and holding the lower branch of the bit* with their lips and teeth, on one side or the other, rendering them perfectly unmanageable. This habit arises either from too sharp, or from too broad a curb-chain, or one that mounts up out of the chin-groove to the sensitive ends of the jawbones. This habit, if once acquired, is a very dangerous one, as such horses are very apt to run away. They need a bit with the lower branches in the shape of a reversed capital *S*. Lip-straps are sometimes used, but with doubtful effect.

To overcome these difficulties I constructed, a few years ago, a *combination bit*, according to the given

dimensions of mouthpiece and side branches, and had attached to it on the upper part of the port a *short movable spoon* of four inches long, and one and one-fourth inches wide, fitting exactly the tongue-channel. This bit has been tried by several authorities in riding, especially on fractious horses, and found to work admirably. Fig. 24.

In fact all saddle and single carriage horses ought to have that spoon attached to their bits, as they like to play with their tongue at the same, thus rendering them light in hand, and, therefore, at all times under control, at the same time preventing their putting the tongue over the bit. The upper branches are bent outward, so as to fit any shape of head. In cases, where it is desirable to allow the horse a firmer leaning on the bit, than is necessary for road-riding, as, for instance, for hunting, a shorter bit may be used, which we may call *dumpy bit.* The upper branch to be exactly of the described dimension, viz: one and three-fourth inches, but the lower branch, instead of being double the length, only to be two and three-fourths to three inches long.

For *small horses* of 15 hands and less, and for *ponies*, the dimensions of one and three-fourths and three and one-half for the upper and lower branches must be reduced to one and one-half inches for up-

per, and three inches for lower branch, the other equally important dimension, the transversal width of mouth, must be ascertained by measurement.

For pairs, mouthpieces with ports are only then advisable, if the bits fit the width of the horses' mouths perfectly ; because, if the coupling reins are short, as is often the case, the bit is displaced in the mouth by force and the edges of the port would invariably cut holes into the bars of the mouth. With long coupling reins, reaching back almost to the hand of the driver, as it ought to be, this evil is lessened, the same time enabling the driver to adjust the reins, if necessary, from the box without dismounting—the port, with or without spoon, is perfectly admissable. Any bit-maker will furnish said bits if dimensions are given.

It is to call the attention of those who love and esteem a horse to the unpardonable injuries done our dumb friends, that I beg to submit these my observations and views on the subject. I sincerly hope they may accomplish their object—that of alleviating the suffering of some of them, and, thereby rendering them more serviceable to their owners.

SADDLES AND SADDLING.

It is not the intention to discuss all the different kinds of saddles in use, as the English or park saddle, the army, the school, the racing, or the cowboy saddle. They all have their advantages, according to their different purposes. The object is to compare the two different kinds of park riding saddles, which we see in daily use. They do not differ much in outward appearances. It is the skeleton, or the tree, that decides their merits, viz: the *wooden*, or the *leather tree*, making all the difference in the world, not only to the rider, but, also, to the horse.

"The *wooden tree* saddle," as may be inferred from its name, is entirely unelastic, and, as long as that unyielding piece of horse furniture happens to fit the horse's back, it may work tolerably well. But the horse may change in condition, losing flesh for instance. This wooden unyielding tree cannot adapt itself to the altered circumstances, and the so-much dreaded catastrophe is at hand. There is a hole in the steed's back, and both horse and rider get an involuntary vacation. The saddle then goes to the saddlemaker for repairs, but no amount

of re-stuffing can make an elastic saddle out of it. One may say: "We cannot afford to keep two or three saddles for each horse. It is the business of the groom to see to it that it fits. He knows all about it." Well, he may or he may not.

Now, let us investigate the second kind of saddle with "*the elastic leather tree.*" This kind of saddle fits any horse's back, and is made so solid as to last three generations, and thousands of horsemen testify to-day to their unsurpassed qualities. This kind of saddle answers its purpose in every way. The yielding and elastic leather tree accommodates itself at all times to the shape of the horse's back. It fits by its elasticity and is not liable to produce sores. The rider in the saddle, the whole *under surface* bears equally upon the back, and, therefore, for long rides, or, for those riding in English style, these saddles do not have their equal—not only saving the horse's back from harm, but also, giving comfort to the rider, as they afford a softer feeling for the seat than the wooden tree ever can. As to the *upper surface* of both kinds of saddles, it is plain that we ride more comfortably on an elastic than on an un-elastic surface, the more so, as the seat of the leather-tree saddle is lightly stuffed, breaking the rebound considerably in favor of the rider.

As to the absolute weight and size of the saddles, the lighter it is, the better for the horse, though there are certain limits, depending entirely on the build of the rider. Heavy weight needs a large under surface, and thereby the saddle becomes heavier. *Ladies' saddles* are generally heavier than gentlemen's saddles, on account of the fair rider's side-seat, requiring a larger under surface. As a rule, our ladies' saddles are altogether too massive. Every ounce of unnecessary weight ought to be avoided, as it will tell on the horse, which oftentimes is of very light build.

The jockey rides a saddle as small and light as possible, knowing quite well that every ounce of overweight will influence the speed of his horse, short as the trial is. Why should this not also hold good for ladies' saddles?

The importance of this seems to be now fully understood, for some manufacturers are at present constructing a decidedly lighter ladies' saddle, with a large opening over the withers, so as to avoid all possibility of bruising. The difference in weight between the old and the new kind of saddles is from eight to twelve pounds. On this saddle, the equestrienne sits close to her horse's back, and her bridle hand is, therefore, lower down, permitting a pull on the reins straight back in a direction parallel to the

horse's spine, which alone will reach the haunches of the horse. With the old saddle she sits too high above her horse, which produces a feeling of insecurity, and the pull on the reins does not reach the horse's hind quarters, but goes upward into the air, one reason for the helplessness of a woman when her horse gets fractious.

Nothing can be said about the shape of the upper surface of gentlemen's saddles, as that depends wholly upon the size of the rider; the same is the case with the covering — buckskin or hogskin — kneepuffs, or none, these things being mere matters of taste, though buckskin, on account of its rough surface, affords the rider a firmer hold on the saddle, and for riding green or fractious horses, it may be of advantage.

Saddle cloths are now very seldom in use, though wrongly. The reason may be that those in present use never gave, nor could they give any satisfaction. The object of the saddle cloth is, to protect the stuffing of the saddle from becoming hard and lumpy from the perspiration of the horse, and, to save the iron parts inside the saddle from rusting and breaking. They are usually made of felt or leather. The felt cloth, as long as it is new, fills its purpose pretty well, as it forms a soft layer between the horse's back and the saddle, but, as soon as it gets soaked

with perspiration, it becomes hard, irritating the horse's back, and producing sores, and then it is worse than no cloth. The leather cloth has the disadvantage of not absorbing the sweat, which, finding no escape, will, and must accumulate as a slimy mass upon the back, irritating the back, and, very likely, producing sores and pimples.

The only saddle cloth of real merit is the "Excelsior," the upper surface of which, is of fine yellow felt, of the color of the saddle. The under surface, coming in contact with the horse's back, consists of the finest knitted wool, with ridges woven in it, running from front to rear, thereby admitting a free circulation of air. Where there is air, there is no friction. Another feature is, that this fine wool fastens itself in the hair of the horse's back, thereby preventing the saddle from slipping forward. This latter fact is quite important for hunting men, and all those, whose horses are inclined to curve up their back after mounting, oftentimes the result of too tight girthing, or sensitiveness of the back, thereby shifting the saddle and rider forward upon the withers. So, also, with horses of low withers and with plungers. With this saddle cloth, slipping will never happen, and, when the saddle is taken off, after a hard ride in warm weather, the horse's back will be found nearly dry, on account

of these ridges. With these saddle cloths on, there is no need of severe girthing, as the saddle cannot slip. These saddle cloths are cut exactly in the shape of the saddle, and having the same color, look very neat, besides saving the saddle and the horse's back.

Girths are made of all kinds of material, such as leather, hemp, hair, etc., all answering their respective purposes quite well, so far as the first saddling of the horse is concerned. But the trouble begins, after the horse has been in motion for some time, when, by natural causes, the girths become loose, permitting the saddle to slip forward, or to turn sideways. This is especially the case with ladies' saddles on horses with low withers, or flat and light barrels, and we have either to take the risk of having our horse's back bruised somewhere, and our safe seat endangered, or, are obliged to dismount on the road to readjust the saddle.

A really practical saddle girth is "*New adjustable saddle girth*," which is plain, simple, and fits any saddle. Fig. 25. The whole arrangement is on the double pulley principle, and consists of only one broad girth in two sections, overlapping each other, and connected by a pulley. About six inches from these overlapping ends are the pulleys in the shape of a square double buckle, laced together by a strap. The outer

ends of the girth, provided with buckles like any other girth, are fastened to the saddle straps, on either side, and the tightening of the saddle is accomplished by drawing the overlapping ends over each other by the pulley strap, located on the right-hand side of the saddle. This arrangement is similar to that of the army saddle, but looking very neat, and without the big ring at the side, which at the best, must pinch the horse. This girth fits any horse, big or small, quite unlike the common girths,

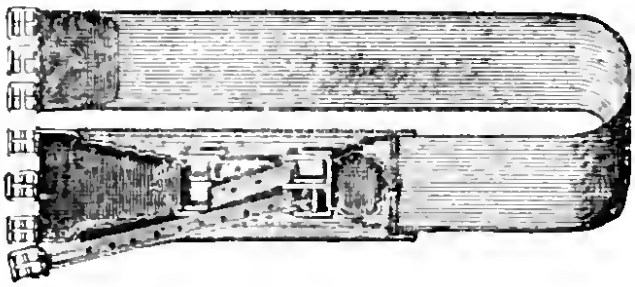


FIG. 25.

which sometimes happen to be too long, or too short. The end of this pulley strap being provided with a buckle, is fastened to strap on the right side of the saddle. It can be tightened or eased by the rider without dismounting or even loosening his or her seat in the saddle, however troublesome the horse may be. It makes the most obstinate horse as easy as the most tractable to girth up properly, and any woman or child can easily adjust it. It is equally

desirable for all riding saddles, hunting, polo, park, military, ladies', or children's. For ladies, particularly in the hunting field, as also for horses having to turn out shortly after feeding, it is simply invaluable, quite especially for cavalry, doing away with the necessity of very tight girthing at the start, sometimes so dangerous for rider and horse. There is another kind of girth made of braided cord, which is very durable, and prevents the slipping of the saddle, as it fastens itself in the hair.

In *stirrups*, there is a great variety in shape and weight. Leaving shape as a matter of taste out of consideration, we find three kinds of gentlemen's stirrups, the light, the heavy, and the safety stirrup. The *light stirrup* should only be used for racing purposes, or by boys; for gentlemen it is a rather dangerous stirrup, as, on account of its lightness, it is very apt to slip back on the foot, and in case of the rider losing his balance in the saddle, it is very difficult to disengage the foot quick enough, and a serious accident may be the result. Or, the rider holding the stirrup with the ball of the foot, they slip off in front very easily, flying around in all directions, and it is very difficult to re-catch them again.

Not so the *heavy stirrup*, which, by its weight, offers more stability and safety for the foot. It is easily

caught when lost, and is not so apt to slip back as the former.

The *safety stirrup* seems to be the best, for being heavy and opening on one side, it may become a life preserver in case of an accident.

In *ladies' stirrups* there are also different kinds—the *slipper*, which is perfectly safe, though easily lost, and a clumsy affair; the *Victoria*, about the worst and most dangerous stirrup in existence, as, through its being padded all around, it becomes too narrow, even for the smallest foot. If button boots are worn, the buttons are caught by the padding, and, in case of a fall, the rider may not be able to disengage her foot quickly enough. There are several kinds of *safety stirrups*, of which the "Reliance" seems to be the best, as it is really reliable. It is a double stirrup, a small one inside a larger one. The foot is placed in the inner stirrup, and in case of a fall, this inner stirrup turns around thereby opening the foot-blade and the foot drops out.

In *saddling a horse*, the first question arising is, where is the proper place for the saddle? The construction of the horse's shoulder is our only and unalterable guide, and we cannot, with impunity, go back on that, as the result would be, sooner or later, weak-kneed horses, or broken collar-bones.

We all know how desirable, and necessary it is, for the comfort and safety of the rider, that the horse should have a well-shaped and oblique shoulder and high withers. This, combined with moderately long and oblique pasterns, will secure an elastic and free action.

Now let us examine how the shoulder-blades are attached to the body. They are fastened to the chest by powerful muscles and the skin, moving in an up and down direction, around an axis situated about four fingers below the top of the shoulder, so that, if the horse lifts his fore leg, the short part above that axis moves back and downward, whilst the part below that axis moves forward and upward, as we can easily feel by putting our hand to the upper end of the shoulder-blade. The reverse takes place if the horse puts his foot down, and shifts the burden forward. That shows us, that, if we place the saddle right close behind the shoulders (the horse standing still), and the girths are tightened, the saddle must interfere with the free action of the muscles when the horse is in motion. The result being short, stiff, and unsafe steps to the ruin of the horse's fore legs, and the safety of the rider. Therefore, *the saddle should be placed* about the width of two fingers behind the rear end of shoulder-blade, so as to secure a free and safe

action of the horse. Of course, a horse with a naturally straight shoulder, is *per se*, not fit for saddle use, and no amount of proper saddling can prevent, sooner or latter, a *salto mortale*, horse, rider, and all.

It is really amazing how little most of those in charge of saddle horses understand these facts, of which we can daily convince ourselves.

The *girths* should be placed directly under the middle of the saddle so as to make the whole under surface bear equally all over the back. There are generally three girth straps, two under the middle of the saddle, and one, more in front as a reserve strap. If the girths are fastened to the two front straps, the pommel of the saddle will be pressed down upon the shoulders, interfering with their free action, very likely, galling the withers, and the cantle of the saddle will be in the air. The rider will slip forward, or, if he sits back by force, the girths must either break or take the wind out of the horse. The girths come too near the fore legs, if fastened in this manner, and the respiration of the horse is seriously interfered with. Whereas, if the girths are fastened to the two backstraps, under the middle of the saddle, the horse will suffer no inconvenience. That is easily explained by comparison. Let a person fasten a strap very tight around his chest,

and he will soon find that unbearable. All acrobats and runners, put a strap around their waist, because it assists them in their efforts. The main portion of the lungs are enclosed by the chest (or by the true ribs in the horse), while the small ends or the loops of the lungs do not need so much room for expansion. Why should that not be the same with the horse?

Furthermore, if the rider sits then in the middle of the saddle, the equilibrium between horse and rider will be established. Or, if the rider sits very far back on the loins of the horse—which loins, by the way, are not intended by nature to carry the weight directly, a thing we see practised very often by thoughtless riders, causing considerable pain to the horse, as the kidneys are located right underneath the loins—the saddle will tilt up in front, and shift forward, the result, possibly, being a sore back. Horses, with ticklish backs, may resent such displacement of the weight by kicking vigorously, such movement sometimes followed by a graceful imitation of the catapult on the part of the rider.

The fastening of the girths is seldom properly performed. Many people throw the saddle rudely down upon the horse, as if the latter were a log of wood, thereby irritating many horses, especially mares, to such a degree, as to make them jump in the

corner of the stall. Then they take up the first girth, strapping it to suffocation, then up the second girth in the same way. Others, again, instead of pulling the girths upward, pull them against the horse, throwing the animal entirely off his feet. Many a horse has been spoiled for lifetime by such practices, being taught to kick, or bite, or swell themselves up so as to protect themselves against over-girthing, the stupid groom, standing by, wondering at the viciousness of that beast.

The proper way, is to put the saddle down easily upon the back, take up one girth after the other, fastening them loosely, and then tighten them gradually, hole by hole, until they are just snug enough to hold the saddle in its proper place. After that, put on the bridle, turn the horse around, back him into his stall, and tie him loosely on both sides, until he is wanted. In this way the horse suffers no pain, and his temper is not disturbed. Finishing of the girthing is done before the rider mounts. Horses should not be saddled before one hour and a-half after feeding, as they need that time for digestion; but, in case they have to turn out sooner, the girths shou'd not be drawn very tight, as the result might be, especially with high-tempered horses, a rush of blood to the brain, under circumstances, endangering the life of the rider.

The stirrups should be hung just under the seat of the rider, as in this position only, the rider gets a firm footing upon them and a protection against slipping off. As a rule, we find them attached too far forward, giving the thigh an oblique direction forward, and the footing upon the stirrup will be in a diagonal direction to the seat. To establish his balance, the rider is then compelled to lean forward, sometimes twisting his body in the most wonderful curvatures, to the detriment of the horse's knees. And in case of the horse shying, kicking, stopping short, or wheeling sharply around, etc., it may possibly be accompanied by a voyage of the rider over the horse's ears, or by a fall to the side, all because the position of the foot is in an oblique direction.

He who wishes to ride safely, and comfortably, should make it a habit to examine, before mounting, whether saddle and bridle are in proper position.

ABOUT STABLE DRAINAGE.

In the interest of horse owners, and to promote the health and well-being of our most useful and willing servants—our horses—also to keep away sickness from stables, the following suggestions for the laying of stable floors are submitted:

For a stall 5 feet wide and 9½ feet long, the flooring would be as in cut, Fig. 25, showing the whole arrangement, and the laths, and iron drains, as they are joined together.

Give 3½ feet for the front boards, laid cross-ways, then put down a board 2 inches thick on either side of the stall, 6 feet long, 16 in. wide, overreaching the gutter behind the stall by about one inch, the rest in the middle is for the laths and drains.

The *laths* ought to be of hard wood, (beechwood is best), and rabbetted 3-16 of an inch, so that the iron drains fit exactly under the laths, thereby an escape of urine is made impossible. These laths are 6 feet long, 3 1-2 in. wide, and 2 1-2 in. deep, and rabbetted from the bottom up 1 1-4 in. They are fastened down to the under-flooring by long screws, for the sake of easy removal, if necessary. The

head of screws should be sunk down to avoid hurting the horse.

The incline of the floor from head to gutter, should

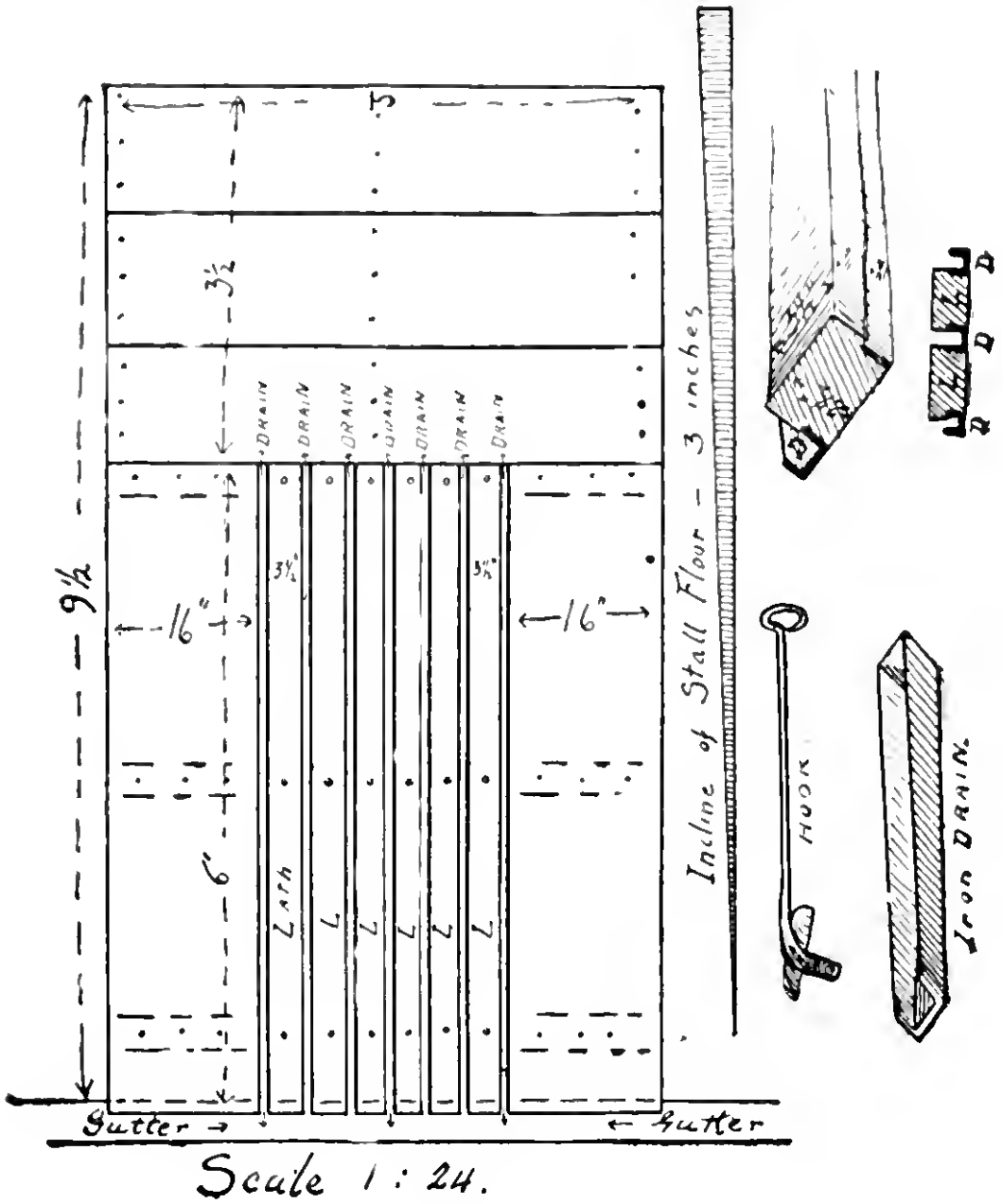


FIG. 25.

in no case be more than 3 inches, for, if steeper, it affects the joints and loins of the horse.

The *iron drains* are 1 1-4 in. high, 1 in. wide inside, about one-eighth inch thick, and 6 feet long, and closed at the head end.

The urine flows off through the iron drains into the gutter behind the stalls, and from there through the conducts to the sewer.

This method of laying stable floors is not uncommon in Europe, and has, of late, been introduced in the new stables, built by the Lion Brewery, Ninth avenue and One Hundred and Eighth street, New York City, where it gives complete satisfaction, and the cost is very little.

It is a fact that, perhaps two-thirds of our horses are, after a day's hard work, not only badly cared for, but condemned to seek rest and recuperation in stables unfit for any living creature, badly *lighted*, badly *ventilated*, and worst of all, entirely *inadequately drained*.

The poor creatures are condemned to inhale, during the whole night, the health-destroying vapors of a rotten floor, and bedding saturated with ammonia and all this because the present way of flooring stables is altogether wrong. This nuisance could be easily removed by simply breaking the old custom.

An improvement in this direction would be an act

of mercy and justice to our faithful servants, a saving to their owners by preserving their horses' health and usefulness, a saving in straw and harness, and a benefit to the inhabitants living near stables.

May this appeal to the sense of justice of horse-owners, not go unheeded for the sake of the ill-judged saving of a few dollars. Every horse-owner can afford that small outlay.

Iron drains can be had at any iron foundry at a cost of about fifty cents a piece. Hard wood laths about ten cents a piece.

ABOUT DRIVING.

ONE HORSE OR A PAIR — FOUR-IN-HAND OR TANDEM.

Driving a Pair.

The horses should be properly matched, in every point, properly bitted and harnessed. They should be of the same height and disposition, have the same action, and carry their heads alike.

Reins and whip are the means whereby the driver communicates with his horses. Short sounds and words complete the correspondence between them. The right hand may properly be called *the assisting hand*; first, because it holds the whip, and gives the summons to start; second, because of its assisting the left hand in stopping and turning the horses, in shortening and lengthening the reins held in the left hand, Fig. 26.

The left, or guiding hand, holding the left line between thumb and first finger, the right line between second and third fingers, should be rounded off somewhat inward, and be carried with the under arm at right angles with the upper arm. As in riding, the wrist should be kept loose, not rigid, the hand stand-

ing quiet and being closed, so as to prevent the reins from slipping through the hand.

The manipulations of turning, stepping back and stopping, (more fully explained further on), are accomplished by the right (assisting) hand grasping easily into the reins in front of the left hand. The *shortening* of the reins, whenever necessary, is carried out by drawing them back from be-

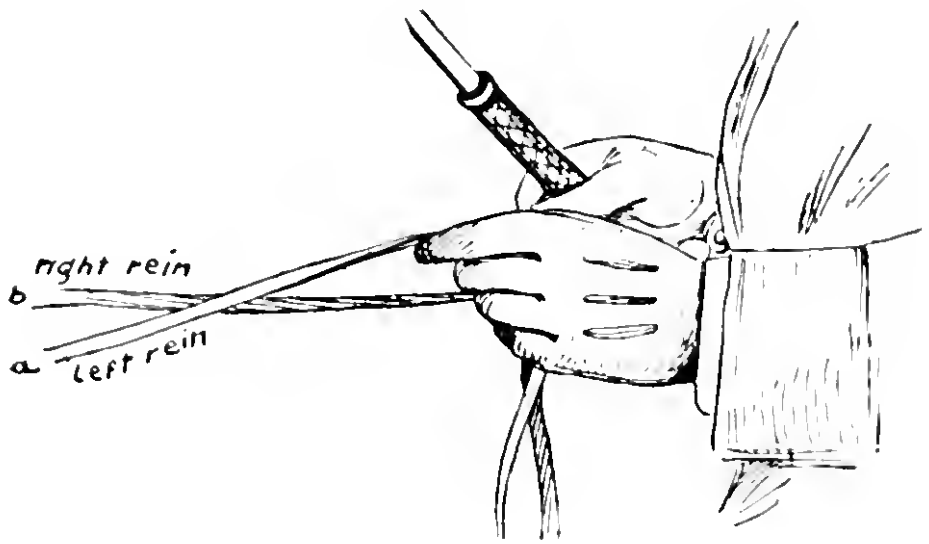


FIG. 26.

hind the left hand; *the lengthening*, by letting them slip through the slightly opened fingers forward.

The *whip*, or the instrument whereby the horses should be animated to step forward, similar to the pressure of the legs, or the application of the spurs in riding, should not be used only for punishment, but, particularly, as a means to regulate the paces

to equalize the differences in the temper of the horses, and to assist in the correctness of the turns.

The driver should be eagerly bent on handling his team in an elegant manner, so pleasing the eye of even the uninitiated.

The *hints with the whip*, also the lighter cuts, and lastly the punishing cuts, must be executed with a flexible wrist, hitting the horse from below to upward, and, if necessary, be repeated with increased force. The further forward of the hindquarters the whip is applied, the better, for, if administered far behind, it might provoke some horses to strike out, or kick over the traces. Sometimes the whip has to be used also on the inside, for instance, with a horse leaning against the pole, and carrying its head too far outward when going up hill or over heavy ground.

If it becomes necessary to punish, begin with light cuts administered far forward. The driver should be moderate in this and never hit a horse at the wrong time, nor show the ruffian by thrashing the horse. To abuse high-bred, spirited horses, means pouring oil into the fire, and to show off one's force in thrashing a lazy or low-spirited horse, is a contemptible act, making at all times a very bad impression. High-bred horses, punished at the wrong time,

will be sure to bring the imprudent driver in trouble, sooner or later, if not endanger the carriage and its occupants.

The gradually increasing effect of the whip upon the horses removes their fear and saves the occupants of the carriage unpleasant jolts and jerks, brought about by injudicious and rude handling of the whip. It is not desirable, that horses be too much afraid of the whip—jumping at the least touch of it. Cajole them with it, thereby, you will make them accustomed to it and allay their fear. An intelligent driver knows how to teach his horses the difference between hints, punishment, and cajoling. If there are occupants in the carriage, punishment should only be resorted to as the last thing, and even then, very moderately.

The correcting of the horses should be done during the time of training, or exercising them, and if possible, unobserved, to avoid bad impressions.

It should be mentioned here, that many coachmen have the very bad habit of continually using the whip, thereby either irritating their horses, or rendering them entirely unfeeling and unable to distinguish between hints and punishment.

The best appearance the driver on the box always presents is, if he remains perfectly quiet and straight, though not rigid, during the many manipulations,

giving the hints to his horses as little perceivably as possible.

THE POSITION OF THE COACHMAN ON THE BOX.

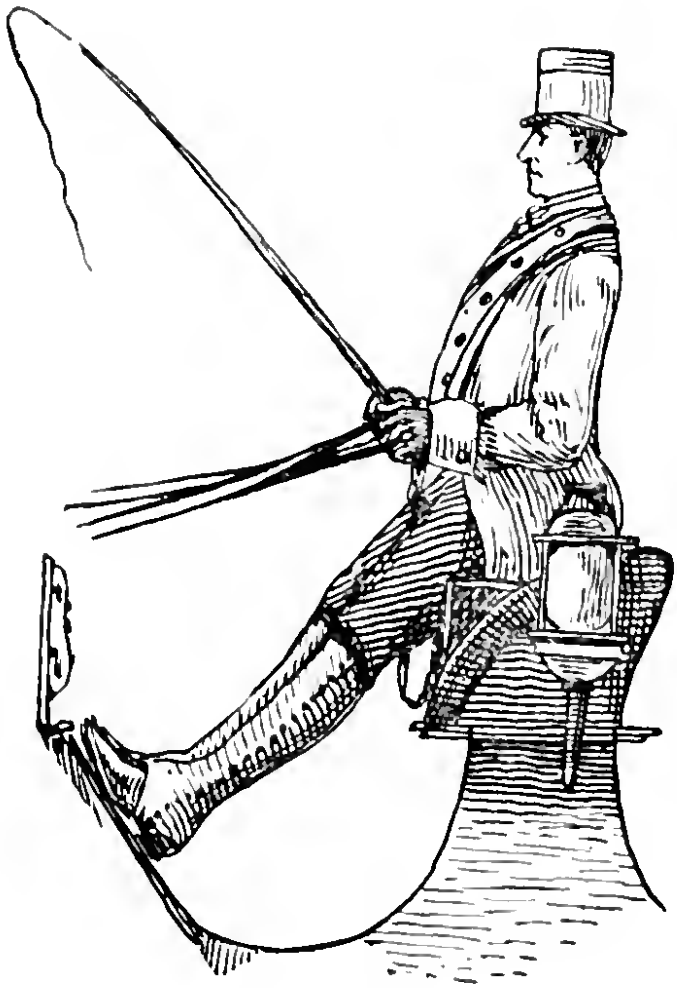


FIG. 27.

The position of the coachman on the box, should be unconstrained but straight, the legs stretched out as far as possible, to establish a firm support for the

handling and stopping of the horse's toes and knees close together, the upper arms held down perpendicularly, and close to the body, forming at the elbow a right angle with the under arms; the hands straight with the under arm and placed before the middle of the body with the wrists slightly rounded off.

The reins are held in the left hand; the left rein on top, between thumb and first finger; the right rein between second and third fingers.

Both reins should be equal in length and just tight enough to feel the horses' mouths, but not too tight. The whip should be held in the right hand in an oblique direction, pointing to the left and forward toward the ear of the near horse; the lower, thicker end of the whip, according to its length, extending downward for a length of about four inches below the hand. The whip-hand should be placed near the left hand, on the same height, or slightly forward.

The well-trained coachman, seated on the box, should, in waiting before the house, sit perfectly still and straight, avoiding all twisting and turning of his body.

STARTING.

The driver, holding the rein-hand (left) perfectly quiet, should give the hint to his horses for starting

in a low hissing tone, or by the word "come," at the same time lowering his hand so as to give them rein enough to come up to the collar, then regulate the pace by laying on, or touching with the whip. First start at a walk, and after a few steps go over into a trot. If one, or both horses, especially young ones, do not start well, turn them first a little sideways, thereby loosening the carriage from the spot, and from this sideways motion they will easier find the start.

The trot ought to be an even one for both horses, so that neither of them may be overtaxed; the lazy horse must be brought up to the bit, as otherwise he would be favored at cost of the other horse. It is quite essential for economy and appearance sake that both horses should be of the same temper.

On straight roads, and with light vehicles, it is customary to drive with one hand, the left only; but, under special circumstances, as, for instance, in narrow roads, in crowded thoroughfares, or with elegant carriages, where style comes into play, it is advisable to use both hands; that means, hold both reins in the left hand; the right in front, or near the left, so as to be always prepared for a sudden turning out or a stop. At all times keep your horses well up to the reins, for if one of them goes behind the rein, the pace must become uneven.

STOPPING.

The passing over from a trot to a walk, or to a halt, should, if circumstances do not demand a short stop, be made gradually, so as to prevent the horses from slipping—especially on pavement—as also to protect the occupants of the carriage from getting jolted. In driving with one hand, turn your left hand inward and upward, the little finger mounting upward toward the body, thereby effectuating a pull on the lines. A stylish driver will never be seen lifting his arms up, or taking them back, or turning out his elbows. Throwing back the body is only admissible as a support in case of an unexpected sharp stop becoming necessary. In that case it is preferable to grasp with the right hand into the reins in front of the left; the right hand being generally the stronger, by drawing back the lines, a stop will be effectuated. The whip must be in readiness, so that, in case the hands having acted too sharp, a touch of the whip will bring the horses up to the bit again.

BACKING.

Both horses should step back alike, on a straight line, assisted by familar pulls on the lines, placing the carriage in an oblique position thereby being avoided. The horses should not be permitted to

hurry backward, but step for step. Lines and whip must assist each other. If one horse gets fixed, and refuses to back—frequently the case with young or not sufficiently trained horses—the coachman must loosen it first by light touches of the whip, then, as soon as one or two legs begin to move, the horse will yield immediately to the renewed pulls on the reins. Backing in a small space, or in narrow passages, for the purpose of giving the carriage some other direction, must be done, very carefully, by turning the horses on the spot toward that side where the hindpart of the carriage is intended to be placed.

For instance, you are compelled to drive up to a house-door upon your left hand side, the street being blocked up by other carriages, and you see no other chance but to back your carriage in to the door. Turn your horses to the left, as far as there is room to do so, let them then step back so far until your left hind wheel reaches the spot where you intend to place the carriage; then, swing your horses slowly to the right, the same as you turned them before to the left; let them back slowly, which will bring the left fore wheel to the desired spot in front of the hind wheel, and finally turn your horses straight before the carriage, and you are at the intended place.

To execute a short *turn about* on the spot is still more difficult. At the first turn sideways, swing your horses around carefully and so sharp, that they come to stand at nearly right angles to the carriage, taking care not to move the hind wheels from the spot; then back and, at the same time, turn your horses in the opposite direction, thereby bringing the carriage into the new or opposite direction. All changes of direction of this kind, should be executed with great calmness and carefulness, and never by jerking and rude whipping, as then the purpose could never be reached, and the carriage might become damaged.

In winter time, if the horses are sharpened, it is better to avoid, if possible, all similar sharp turns, as the horses are very apt to hurt themselves seriously.

TURNING.

In breaking in young horses, or, in driving in crowded thoroughfares, it is advisable to drive with two hands, that is: take in each hand, the corresponding rein, or else, the left hand holding both reins, must be assisted by the right. To all turns the impulse is given by the right hand, and as this is also holding the whip, it has to animate one or the other horse, so as to support the pull on the reins, and to

keep up the pace. While the left hand is holding the reins in the described position, the right hand, before beginning any change of direction, will grasp into both lines over and in front of the left, and, by gathering the horses, prepares them for the turn ; and

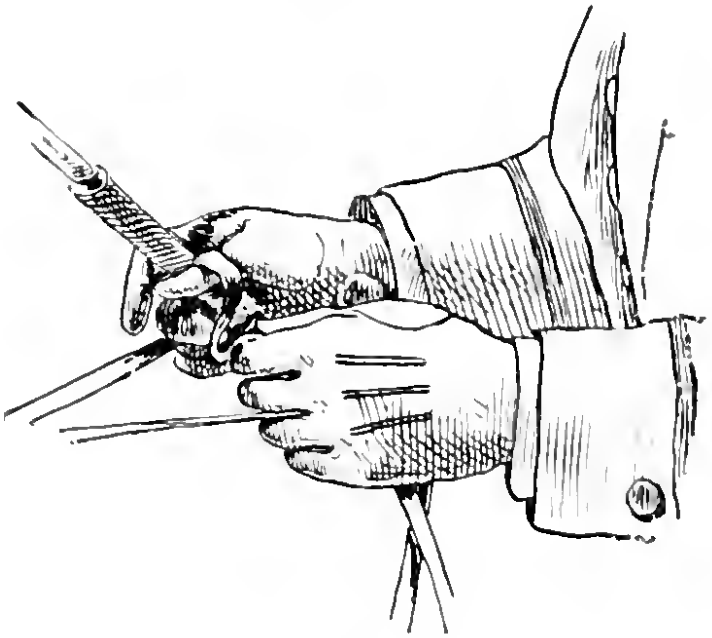


Fig. 28.

then, taking hold of the inner rein with the first and second, or second and third fingers, gives the impulse for turning. Fig. 28. With well broken horses, a light pressure upon the rein being sufficient, the same must be increased, with not sufficiently trained, or sluggish or spoiled horses, until it takes effect. First give the hint to the inside horse, which has to begin the turning, and finish the same by alternate, more or less, strong and repeated pulls, at the same

time, shifting the left hand slightly forward, so as to give more rein to the other horse; both horses assisted by the whip. There is for instance, a stronger effect necessary on the outside horse, after the turn is finished, to bring both horses up to the bit, and into the new direction. It is a well-known fact, that broken horses are inclined to go too quick and too short into the turns; the whip has, therefore, first to drive the inside horse easy into the reins, and to watch over it, that the traces of the inside horse first *bring* the wagon. The outside horse, having the longest distance to travel, must in case of his hanging back (oftentimes caused by the driver omitting to give the outside horse sufficient rein by shifting the left hand a little forward), be brought up to the bit, by touching him on the inside. In short, with lines and whip, an experienced coachman will execute a correct turn.

TO TURN TO THE LEFT.

Put the right hand over the left, take hold of the left rein and pull it backward, lift the thumb of the left hand, and close it down upon the loop formed by the rein, and after the turn is made, let the loop slip forward again through the hand. The left hand alone should make all turns, so as to leave the

right hand free for the use of the whip. As soon as the near horse has received the impulse for the turn by the line, it must be animated into the turn with the whip, so as to *bring* the carriage, that is to pull the same by the traces into the new direction.

Inexperienced drivers generally give the impulse for the turn to the left, by pulling the left rein, closely followed by an animation of the off horse. The consequence is that the off horse throws himself against the pole, and the pole against the near horse, compelling the latter to fall out with shoulder and body, thereby preventing him from pulling. The rules for driving one horse or a pair are generally the same.

In *turning to the right*, place the right hand full upon the rein.

DRIVING FOUR-IN-HAND.

The first requirement is an exact knowledge of how to handle the lines, and calmly to guard and regulate the paces of the horses.

There are *several ways of holding the reins* in the left hand, *the first being:* Take up the lines of the wheelers into your right hand, the left line between first and second fingers, the right, between second and third fingers, and equal them out. Then take the lines of your leaders into your left hand, and

equal them out; then shift them over into your right hand, so that the line of the nearside leader rests between thumb and first finger, and the line of the off-side leader, between first and second fingers and on top of the rein of the near-side wheeler.

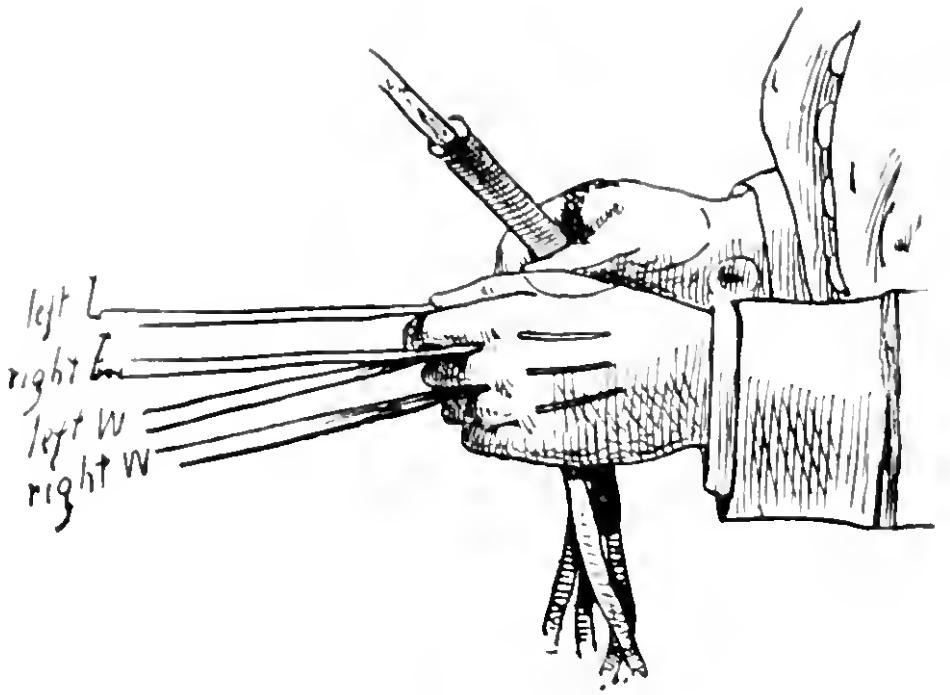


FIG 29

Mount the box with the assistance of your left hand, and when seated, transfer all four reins over to the left hand, in the same order as you held them in your right hand, equalize them, take the whip into your right hand, and you are ready to start.

The right hand, so as to be ready for any emergency, should be placed a little forward of the left

hand, leaning against the lines, and acting from there on all four lines.

Close the left hand fully, so as to prevent any lengthening out or entanglement of the lines, because you have four horses before you, and one pull on the wrong line may throw the whole team in confusion. The whip should be held as in driving a pair. Should it become necessary to shorten the lines, grasp the ends of the reins hanging down from the left, with the right hand, either slipping the left hand a little forward, or pulling the lines downward through the left hand. Keep in mind, that those lines which become too long, must be pulled through the hand backward, while those which become too short, must be allowed to slip through forward.

If, during driving, you have to lengthen out, or to shorten one or the other line, grasp the same with two fingers of the right hand; for lengthening out in front of the left hand, and for shortening behind the same, pull them forward or backward.

To start correctly with four horses, it is essential, that all four should stand straight in the lines, and the leaders start a moment before the wheelers. A rushing forward of the wheelers must be carefully prevented, to avoid their running into the leaders, possibly followed by kicking and entanglement in

the traces, and by general disorder. In all paces, turns or short stops, the wheelers should be held a little shortened by the right hand, to prevent collision with the leaders.

In general, the wheelers are the real draught horses of a four-in-hand; the leaders, commonly of lighter build, are more of an appendage, their pulling amounting to little. Driving four-in-hand must be classed under the luxuries, and, performed by a stylish driver, presents a most beautiful aspect. The equalness of the tension of the traces and lines is a prime factor. If, unintentionally, the team should deviate from the straight line, the oblique direction must be corrected principally by the wheelers.

Before *stopping* a four-in-hand, the coachman has to examine if all four lines are in equal tension, and then begin reining in the wheelers first, immediately followed by that of the leaders.

In *backing*, first let the leaders step back a little, and as soon as they begin the motion, pull back the wheelers; if reversed, the wheelers would find resistance from the leaders.

Turns are executed in a similar way as in driving a pair, but with the difference that the fore lines have to act first.

Never turn the leaders too sharp, or too sudden—a

mistake generally made by beginners—considering that by doing so, the leaders coming into an angular position to the wheelers, the direction must become a broken one. The leaders should only receive a slight hint for a change of direction, and step only gradually into the new line of travel, so as to enable the wheelers and the coach to follow in their tracks. For this reason, begin all turns in good time, and gradually, especially in narrow streets, etc.

Turning to the right. Take hold of the right fore line with your right hand, and give the offside leader the hint to turn gradually, at the same moment, the right hand grasps the line of the nearside wheeler, causing him to step diagonally to the left, so as to follow in the tracks of the leaders just swinging over to the right ; the right hand wheeler, whose part it is to bring the vehicle, must be animated into the turn by the whip. Move your left hand slightly forward, to enable the left leader to follow the right hand leader. As soon as the leaders are in the new direction, the pull on the right fore line must cease, and only the wheelers, but, merely by hint, must be led into the new direction. After all four horses are in the new line of travel, the pull on the different lines ceases, and the latter are equalled out to keep the horses in a straight direction. Turning to the

left is accomplished in the contrary way; the circular and short turns are executed in the same way, always bearing in mind that the wheelers have to follow in the tracks of the leaders, and should never be jerked at the same time into the intended directions.

In putting together a four-in-hand, always see to it, that the wheelers are the heavier horses, and at the same time, quieter in temper. The left leader should be an active, intelligent horse and well-broken. This is of special advantage and value in driving from the box. Very properly this horse is called the leader of the four-in-hand.

Before putting the four horses together, it is advisable to exercise them first in pairs, so as to take out all friskiness and unevenness in the paces.

In *going down hill*, the wheelers alone, have to hold back the coach, but care should be taken to prevent the leaders from hurrying forward, or from hanging back, as in the latter case, the pole, or the leadbars, might touch them, and the traces become too loose.

In going up hill, let the leaders do their share in pulling.

The handling of a four-in-hand is very difficult, and needs much practising. The whip, on account of its length, is sometimes very much in the way, and after each use, the lash should be caught

up by the hand. The wheelers are to be animated by the gathered whip; the leaders by the lash. To do the latter properly, that is, to hit the desired spot, or even the respective horse, is not an easy matter.

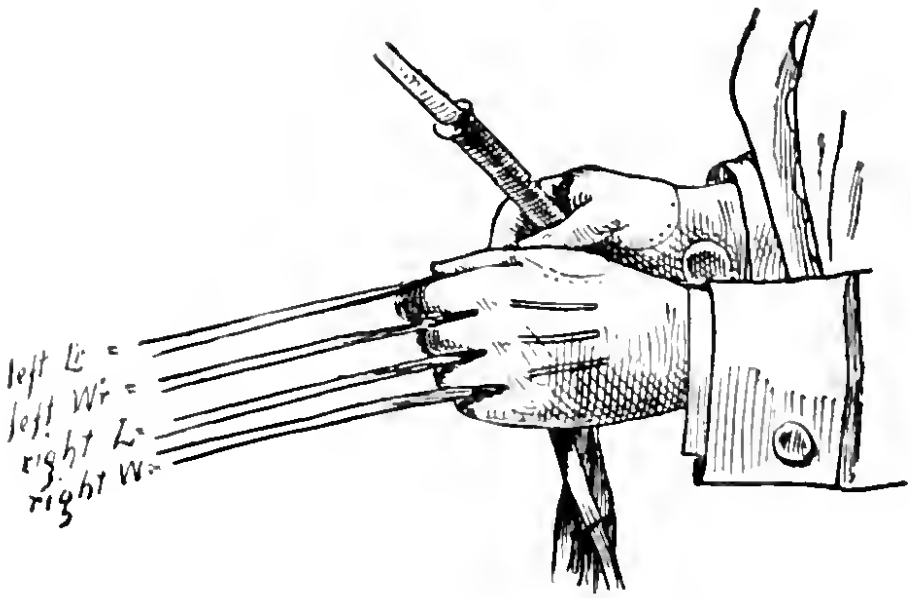


Fig 30.

Another way to arrange the four lines in the left hand, is as follows:

(*a.*) The line of the left leader between thumb and first finger.

(*b.*) The line of the left wheeler between first and second fingers.

(*c.*) The line of the right leader between second and third fingers.

(*d.*) The line of the right wheeler between third and little or fourth fingers.

In this way there is a line between each two fingers ; the lines of the left side (near) horses being the two upper ones, and the lines of the right side (off) horses, the two lower ones.

For breaking-in young horses this way of arranging the reins may be of advantage, as in case of emergeney the reins of the rightside horses are easily transferred over to the right hand.

TANDEM DRIVING.

Tandem driving requires as much, if not more, dexterity as driving four-in-hand. Select for this purpose, safe, lively but never excitable horses, the leader to be a horse that does not shy, so as not to disturb the driving direction by starting sideways. Horses used to go single are the best for the purpose.

Manipulations and holding the lines are the same as in driving four-in-hand.

Concerning the hitching, let the traces of the leader be a little longer, as in four-in-hand. These latter are either fastened to the shafts, or to the traces of the shaft horse, and held up by two straps, attached to the collar of the shaft horse. The shaft horse should be hitched firm and short, and should be checked up. The leader may go unchecked.

Rules for driving, especially for turning, stopping, etc., are the same as for four-in-hand driving. The driver must take care that both horses travel on a straight line, and are well up to the bit, and in the traces.

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